Railway Age Gazette

DAILY EDITION

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Vol. 54. NEW YORK—JUNE 17, 1913—ATLANTIC CITY No. 24d.

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE, BY THE SIMMONS-BOARDMAN PUBLISHING COMPANY, WOOLWORTH BUILDING, NEW YORK.

CHICAGO: Transportation Bldg. CLEVELAND: Citizens' Bldg.
LONDON: Queen Anne's Chambers, Westminster.

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Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico $5.00
Canada 6.00
Foreign Countries (excepting daily editions) 8.00
Single Copies ..... 15 cents each

Engineering and Maintenance of Way Edition and four Maintenance of Way Convention Daily issues, North America, $1.00; foreign, $2.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

WE GUARANTEE that of this issue more than 9,200 copies were printed; that of those more than 9,200 copies, 7,048 were mailed to regular paid subscribers, 200 were provided for counter and news companies' sales; and 1,700 were printed for distribution at Atlantic City and for use as sample copies.

PERMISSION has been granted the committee on brake shoes and brake beam equipment to continue the series of tests on brake shoes which was begun at Purdue University several years ago. These tests have already given results of great value to the association, and the decision to continue them was to be expected. Tests will now be made at a speed corresponding to 65 miles an hour with pressures ranging from 9,000 to 18,000 lbs. These will be with the same types of shoes which were tested at 80 miles an hour in 1910. It is believed that the data to be obtained will allow specifications to be prepared covering shoes for heavy passenger equipment. In the section of the report on brake beams the most important action was the decision to refer to letter ballot for adoption as a standard, the recommendation that the spacing of the brake shoes should be 60 in. with allowable variations of ⅛ in. either way. The request of the committee that it be instructed to prepare a specification for a brake beam for passenger cars to be submitted for action next year, was referred to letter ballot.

A NUMBER of years ago when the subject of the lighting of the cars of the elevated railways of New York was under discussion and it was proposed to substitute Pintsch gas for oil lamps, Russell Sage asked: "And what shall I do with all the good oil lamps that we have?" There was no reply but, "Throw them away." The feelings of the millionaire at this iconoclastic suggestion are not a matter of record, but may be imagined. It looks very much as though a similar reply would have to be made to Mr. Schroyer's parallel question as to what should be done with all the good 8-inch brake cylinders if the 10-inch is substituted as suggested in the committee's report on train brake and signal equipment. Equipment has been increasing in capacity for twenty-five years, and the end is not yet. If the retirement of cars of 20 and 25 tons capacity from service is brought about, the 8-inch brake cylinder will have to go, even though it may be as good as new. It will simply add one more to the long list of perfectly good appliances that have gone to the scrap heap because they are obsolete and not because of old age or deterioration. As it stands an increase of brake shoe pressure is imperative and that the 8-inch cylinder cannot provide.

THE following sentence appears in President Fuller's address: "Let us consider carefully all the various recommendations which are placed before us for approval, and let us not lend the prestige of this association to anything that will mean increase in maintenance and operation which cannot be satisfactorily defended before the bar of public opinion on the ground of safety and economic progress." This is good advice for the mechanical association and, indeed, for all railway associations. It is still better advice for law-making bodies and railway commissions, because they need it a great deal worse. If the word "commission" were substituted for the word "association" the sentence might appropriately and profitably be framed and hung up on the wall in the office of every commission regulating public utilities in this country. The principle involved is constantly disregarded. It is easy enough to impose requirements on railways in the nominal interest of safety. It is very difficult to adopt only requirements which actually will be beneficial and which will at the same time accomplish the desired end with the minimum cost. In the long run, the public pays in passenger and freight rates the expense caused by every requirement imposed on the railways; and the commissions should take more care to see that the expenses caused are not out of proportion to the results that probably will be secured.

WITH the tendency in recent years toward more refinement and permanency in American locomotive design has come the increasing use of flange joints in pipe connections. It is probable that the reason for the infrequent use in this country in the past of this type of connection has been the need for easy accessibility for repair purpose; but flange joints have long been in general use in Europe and are practically standard in stationary power plant work, and the change has come with the development of the locomotive into a highly efficient power plant and the consequent necessity for more permanency in construction. In the past few years there has also been a surprising increase in the use of non-lifting injectors, due at least in part to the lack of room available in the modern locomotive cab. With the perfecting of the lifting injector and the increase in the size of locomotives, the earlier non-lifting injectors, which were very often difficult to prime and the cause of much waste of water, were discarded by many roads; but the non-lifting injector of to-day is of necessity a great improvement on the early types. Non-lifting injectors are in every day use on a large number of high-power locomotives throughout the country, in many cases providing the entire water supply, and it will be interesting to watch their future development.

IT is interesting to note that President Fuller, in his address, reports that reliable information from several large interchange points indicates that the number of defect cards issued at interchange points has been reduced approximately one-half as a result of two changes in the interchange rules adopted by letter ballot last fall. The first change referred to abrogated the rules which formerly penalized a delivering line for certain defects in cars which, although primarily owning line defects, became "handling line's responsibility" as soon as the cars were offered in interchange. The second change was to add 10 per cent. to the prevailing M. C. B. repair allowances for labor and material charges in order to make it more attractive to repair

cars while on foreign roads. The delays incident to the enforcement of the carding rule had become unbearable to some companies, while the fact that the existing allowances for repairs were so low as to virtually penalize the repairing road had a most important effect on the number of bad order cars. Both changes in the rules, which were adopted by an almost unanimous vote, but which only became effective on November 1 after strong pressure had been brought to bear against the increased repair allowances by the private car lines, were in the interest of promoting a freer interchange of cars during a time of acute shortage. President Fuller's statement that carding has been reduced by one-half and that the conditions which had caused unnecessary delays were almost immediately relieved, fully bears out the predictions made by the executive and arbitration committees in their resolutions proposing the changes.

IT looks very much as if we were not far advanced from the days of thirty years ago, when the Master Car Builders' Association and the railroad clubs were discussing the relation of the wheel to the rail; when everybody was guessing and nobody knew. Before the first standard contour of wheel tread and flange was adopted there was much talk, much conjecture and high hopes. Then there was more, but not of the same intensity and wide variations of opinion when it was changed as it was done with comparative quiet. But now comes Dr. Dudley, who thinks the present contour is bad for the rail heads and the wheel committee is asked to see what had best be done—stick to the one in twenty taper or go back to the one in thirty-eight, or something else? The mutual effect on wheel and rail has never been studied in minute detail. Cylindrical treads have been used with and without satisfaction, but it does seem as though, had conditions been the same, results must have been identical. The rail effect on the taper and the straight treads is a matter of conjecture and there is little data to support any conjecture that may be made. It is stated and denied that the rail causes a greater tread deformation on the cylindrical tread than on the taper, but no one knows what work has been done seems to indicate that, under the ordinary loads, it is the rail that suffers the greater part of the deformation and that there is little or none of a permanent character impressed on the wheel. We do know, however, that the area of contact between the wheel and the rail is a spot of considerable size; that the load per square inch of area of that contact is well up to and beyond the limit of elasticity of the metal of either the wheel or the rail; that the shape of that area is subject to constant variation as the wheel and rail wear; that the size of the area itself varies with the load, the metal composing wheel and rail, the wear of wheel or rail, and that its point of application runs from one side of the rail head to the other and performs all manner of gyrations around and across the tread, and finally, that every possible cause of variation is subject to change with the weight of the rail, the kind of ballast and the condition of track maintenance. So to the outsider it looks as though the committee had been assigned somewhat of a task when it was asked to determine what had best be done in the matter of wheel tread and do it in a year. But, perhaps, after all, the old assertion that taper is of no moment on a wheel because it so soon disappears and the natural running contour is developed, will hold.

LEAKY CAR ROOFS.

NO problem of car design has attracted more attention in the past few years than that of box car roofs; the result has been a marked improvement in them, and yet not a few railway officers are to be found who feel that there is still much to be desired in this direction. The number of cars now in service which have roofs that will fail under a water test is surprisingly large. One important system on this continent is having a minimum amount of trouble with its box car roofs because it has certain regulations in force which make it necessary to give the roofs frequent attention and thus prevent the development of slight and comparatively important defects. That particular road is fortunate because its cars are not so generally interchanged as those of other roads. If it is not possible to give the roofs systematic and frequent attention in order to keep them in first-class condition, then it is not only desirable, but necessary, that a type of roof be used which will not need such attention.

One of the larger systems has a solid riveted roof, with air spaces at the sides to provide for ventilation, which was applied to about 110 cars a year and a half or two years ago, and has given splendid satisfaction—so great satisfaction, in fact, that cars in service or under order to the number of 10,000, either have or are being equipped with it. The argument is constantly being advanced that it is necessary to have a flexible roof on all box cars to provide against the various stresses to which the superstructure is subjected. The designers of the solid riveted roof under consideration argue that it has been found necessary to develop rigid underframes and that it is just as necessary to have a rigid roof, the former stiffening the box at its lower end and the latter at the top.

If further observation of these cars in service proves as satisfactory as it has on the first cars so equipped, and those in charge must have little doubt as to whether it will or they would not have specified it so freely, then why not go one step further and make an all-steel box car? With a steel underframe, rigid steel roof, and steel members in the side and end frames, it is only a short step further to substitute metal for wooden sheathing. All of which is suggested by the comment in President Fuller's address directing attention to the necessity of giving more attention to the problem of leaky roofs.

STANDARD COUPLER.

MOST encouraging progress toward a standard coupler is shown by the report of the committee on Couplers and Draft Equipment presented at yesterday's session. In keeping with the importance of the subject, the report is one of the most detailed and thorough ever presented to the association. It contained 153 pages, including 148 illustrations and many tables, and gave the essential parts of the discussion at the several joint meetings of the committee and the representatives of the manufacturers.

The development of a new contour which, after further experiment in the laboratory, will probably be recommended for experimental service by all the members, is the most important single feature of the report. This has been termed the Krakau or straight line contour. It provides for a parallel coupler face and face of the knuckle, both perpendicular to the center line of the shank. The advantages claimed for it are that it provides greatly increased strength through the hub of the knuckle and in the front face of the coupler head, and it shortens the average length of the lever arm from pivot to buffing face and will practically stop the bending of the knuckle under buffing shocks. Furthermore, owing to the increase in the longitudinal clearance to 7/8 in. when in the coupled position, provision is made for the vertical angling between couplers when passing over humps without putting a strain on the couplers, and, in buffing on curves, as well as on a straight track, the wedging due to the knuckle engaging the face of coupler head and the face of the guard arm of the mating coupler is avoided. The proposed contour will couple at a greater angle than the present coupler.

There seem to be but three disadvantages in the minds of the committee. These are a lesser maximum angle through which the new contour will swing when coupled; the amount of slack in the heads when coupled together; and the fact that the last portion of knuckle closure is accomplished by momentum when coupling on curves. On large radius curves, however, the last objection does not hold as the new couplers will adjust themselves to straight track conditions up to the limit of the side clearance. The fact that the proposed contour gives an initial slack of 7/8 in. was the subject of considerable discussion in the

committee, and to ascertain how serious an objection this might be in regular service, an investigation was made of the amount of slack existing in the present standard couplers which were in service and in good condition. The test of a train of 61 cars on the Pennsylvania showed an average initial slack per coupler of 1.66 in., and a train of 68 cars on the New York Central gave an average slack of 1.39 in. It thus appeared that the proposed 7/8 in. is considerably under the present everyday condition. The report also anticipates the perfection of a wedge type of lock and, with this, it is pointed out that the slack will not increase in service as the present coupler heads were shown to do. In view of the important advantage of the elimination of the distinctive strains set up in the present couplers in hump yards and on tipple tracks, it seems that the 7/8 in. clearance is a strong point in favor of the new lines.

Tests of a proposed wedge lock in a jiggling machine showed it to have a slight tendency to creep, but it was felt that this could be overcome and, therefore, since the adoption of the new contour hinges so much on this feature, the committee has requested that none of the new designs be put in experimental service, which will eventually settle the question of any trouble that may appear in connection with coupling on curves, until it has made further experiments. It will notify the members which couplers are recommended for trial purposes at a later date.

The result of the general investigation of the subject has convinced the committee that the present couplers are entirely inadequate in strength. It is satisfied, however, that the desired increase in strength can be obtained, but that it will necessitate an increase of from 30 to 40 per cent. in the weight.

TO-DAY'S PROGRAM.

M. C. B. ASSOCIATION.

9.30 TO 1.30 P. M.

Discussion of reports on:	
Safety Appliances	9.30 A. M. to 9.45 A. M.
Rules for Loading Materials	9.45 A. M. to 10.00 A. M.
Overhead Inspection	10.00 A. M. to 10.15 A. M.
Car Trucks	10.15 A. M. to 10.45 A. M.
Train Lighting and Equipment	10.45 A. M. to 11.30 A. M.
Train Pipe and Connection for Steam Heat	11.00 A. M. to 11.15 A. M.
Tank Cars	11.15 A. M. to 11.45 A. M.
Specifications for Tests of Steel Truck Sides and Bolsters for Cars of 80,000, 100,000 and 150,000 Pounds Capacity	11.45 A. M. to 12.00 M.
Topical discussion:	
Retirement from Interchange Service of Cars of 40,000 and 50,000 Pounds Capacity	12.00 M. to 12.30 P. M.
Discussion of reports on:	
Capacity Marking of Cars	12.30 P. M. to 1.00 P. M.
Lettering Cars	1.00 P. M. to 1.30 P. M.

ENTERTAINMENT.

Orchestra Concert, 10.30 A. M.—Entrance Hall, Million Dollar Pier.

Orchestra Concert, 3.30 P. M.—Entrance Hall, Million Dollar Pier.

Informal Dance, 9.30 P. M.—Entrance Hall, Million Dollar Pier.

M. C. B. ASSOCIATION RAISES DUES.

At the meeting yesterday morning it was announced that the executive committee at its conference last Saturday had decided to recommend increasing the annual dues from $4 to $5 per vote. The rate of $4 a vote does not cover the necessary expenses of the association. The recommendation of the committee was approved by the association.

LOST.

Badge No. 2701 has been lost. Finder please return to Secretary Conway's office.

Black belt, with jet buckle, lost on the pier. Return to Secretary's office.

FUNERAL OF ANDREW S. CROZIER.

The funeral services for Andrew S. Crozier will be held in the Calvary Church, at Glen Riddle, Pa., on Wednesday, June 18, at 3 o'clock P. M. Those who desire to attend should leave from the Broad Street Station of the Pennsylvania R. R., Philadelphia, taking the 1.28 P. M. train on the West Chester Branch, via Media.

M. C. B. SOCIAL GATHERING AND DANCE.

The M. C. B. social gathering and informal dance was held last evening at the Marlborough-Blenheim, under the charge of the following committee: Messrs. Hammond (chairman), Hibbard, Furry, Faure, McClintock, Wardell, Caton and Crowe. Like the previous dances held during this convention it was informal and was very well attended.

ELECTRICAL ENGINEERS INVITED TO VIEW EXHIBITS.

The Railway Supply Manufacturers' Association extended an invitation to the members of the Association of Railway Electrical Engineers attending their semi-annual convention to examine the exhibits on the pier.

The A. R. E. E. badge will entitle each member to admission.

RETURN TRANSPORTATION.

The Pennsylvania has notified members of the M. C. B. Association that transportation home over its lines will be furnished to those entitled to it. The Central of New Jersey offers the same courtesy to members who wish to return over its lines or the Reading, application to be made to C. E. Chambers. A special train of parlor cars for New York will leave Atlantic City on Wednesday afternoon at 2.30 over the Central of New Jersey.

Special provision will also be made on the 2.10 train of the Central of New Jersey for members wishing to return to New York at that time.

LOST BADGES.

The convention badges bearing the following numbers have been lost and they have therefore been cancelled. Admission will be denied to any one attempting to use these numbers: 3635, 2536, 4331, 1145, 2941, 3448, 4361, 2563, 2425, 4336, 3580, 2836.

THE PURDUE DINNER.

The annual dinner of the Purdue men in attendance at the M. M. and M. C. B. conventions was held at the Shelburne on Saturday evening, June 14. The following men were present: Dean C. H. Benjamin and Professor L. E. Endsley, Purdue University; F. B. Ernst, American Steel Foundries; J. P. Neff, American Arch Co.; Garland Robison, Interstate Commerce Commission; W. L. Robinson and C. B. Woodworth, Baltimore & Ohio; W. H. Winterrowd, Canadian Pacific; E. E. Silk, Bettendorf Axle Co.; Fred Schaff, Locomotive Superheater Co.; W. S. Humes, General Railway Supply Co.; J. R. Mitchell, W. H. Miner, Chicago; Percy Hauser, W. B. Leet, O. D. A. Pease and B. B. Milner, Pennsylvania R. R.; R. J. Himmelright, Locomotive Stoker Co.; B. F. Bilsland, General Electric Co.; and H. A.

Smith, J. E. Sample and J. M. Lammedee, Railway & Engineering Review, Chicago. The committee, consisting of E. E. Silk, J. P. Neff, L. E. Endsley, W. H. Winterrowd and J. M. Lammedee, having this year's dinner in charge, will arrange for a similar gathering at the time of next year's convention.

COMMITTEE ASSIGNMENTS.

Secretary Taylor announced at the meeting yesterday morning that in accordance with Article VI, Section 4, of the consituation, the executive committee suggested the following names for the committee on nominations: F. W. Brazier, A. W. Gibbs, F. H. Clark, F. H. Goodnow, F. F. Gaines, J. T. Wallis, W. H. Lewis, C. E. Fuller, G. W. Wildin, J. J. Hennessey.

T. M. Ramsdell, R. D. Smith and T. H. Goodnow were appointed a committee on correspondence and resolutions.

The president named the following committees on obituaries: For W. H. Taylor, J. W. Taylor; for H. Schlacks, C. A. Schroyer; for C. F. Gossett, M. W. Seidel; for J. J. Ryan, J. R. Cade; for Harry Coulter, R. L. Kleine.

ANOTHER LETTER FROM MR. LEHON

Atlantic City, N. J., June 16, 1913.

To the Editor of The Railway Age Gazette:

In view of my personal interview and understanding with you in connection with my letter of June 13. I am somewhat surprised at the caption employed by you of "A Criticism, and an Answer."

You know that my letter was an expression of opinion and in no way offered or intended as a criticism; accordingly it was not fair to preface the letter with the suggestion that it was intended as a criticism, although such an interpretation was possible.

Here is one of the greatest conventions held in the country, so creditable and remarkable that both interests contributing thereto have just reason to be proud of it, and while it may be expedient from your standpoint to minimize whatever apathy and inattention actually exists in regard to exhibits, such a policy is not calculated to remedy the situation, neither will it promote further growth and development.

Everyone who has the courage of his convictions expects to be made "the goat" occasionally and for the opportunity offered me by you to serve in that capacity, I thank you.

Tom Lehon.

[It appears that the editorial comments made by us on Mr. Lehon's letter in the *Daily* of Monday misinterpreted its intent and spirit, and we gladly give space to the above further communication from him.—Editor.]

REGISTRATION IN 1911-'12-'13.

The following table giving comparative figures of registration of the M. M. and M. C. B. Association for the years 1911, 1912 and 1913 will be of interest. The figures are based on official Registration Book No. 4, containing all registrations for the 1913 conventions up to 3.40 o'clock Sunday afternoon:

	1911	1912	1913
Members of M. M. and M. C. B. Assns.	712	647	577
Special Guests	757	453	499
R. R. Ladies	699	330	427
Supply Ladies	399	224	281
Supply Men	1684	1465	1611
Totals	4251	3119	3395

Two hundred and forty-five members of the M. C. B. Association registered before noon Monday morning.

Lo-tung Railway, China.—The first section of the Lo-tung Railway from Lo-yang to Tieh-men has been completed, and daily passengers and freight trains between these two stations are now being run.

MEETING OF RAILWAY ELECTRICAL ENGINEERS.

The semi-annual convention of the Association of Railway Electrical Engineers was held at the Hotel Dennis, June 16, Vice-President H. C. Meloy, chief electrician, Lake Shore & Michigan Southern, presiding. President D. J. Cartwright commented on the growth of the association and the constantly widening field for its activities. Much of the work done by it has proved of considerable importance to the M. C. B. Association. The purpose of the association is to study problems that come under its special jurisdiction so that standards may be established that will represent the best practices. While the original work of the association was in connection with car lighting, its opportunities for considering other electrical subjects have greatly increased because of the extended use of electricity in shops and other places on railroads. Secretary J. A. Andreucetti reported an approximate cash balance of $1400 in the treasury and a total membership, including associate members, of 532. There were about 50 members in attendance at the meeting.

A report of progress was offered by the following committees: Data and Information; Dynamo Suspension; Headlight; Illumination; Incandescent Lamp Specifications; Head End Equipment; Organization and Yard Force; Outside Construction and Yard Lighting; Standard Operating Reports; Standards; Rubber Belt Specifications; Shop Practice; Wire Specifications; and Installation of Wiring. The committee on charging of passenger car storage batteries, of which J. R. Sloan, Pennsylvania Lines East, is chairman, presented a full report. Six methods of charging batteries for straight storage were described. The system known as the constant potential system was preferred by the committee and was covered in the report as follows:

A definite fixed resistance is placed in series with the battery and a definite constant voltage is maintained across both battery and resistance.

With this method the ampere hour input is determined by an ampere hour meter operating a circuit breaker to cut the battery off charge. Care must be exercised in determining the proper resistance and voltage to use, and especially must the voltage be held very closely approximating the predetermined value chosen. It may be said in general that the higher the voltage chosen (which conditions the use of the greater charging resistance) the greater will be the permissible fluctuation of voltage. Increased voltage will, however, increase the amount of energy consumed and reduce the amount of the "taper" effect.

The reasons for favoring this system are: The minimum amount of attention is required from the operator who has only to connect the batteries to the charging plant.

The resistance and voltage are taken at such values as to permit using the highest current rate that will not injure the battery, which will be fully charged in a minimum time, while the current being reduced to normal at the end of the charge, excessive evolution of gas at this portion of the charge is avoided, thus maintaining the efficiency of the charge and minimizing the depreciation of the battery.

The elimination of overcharging the battery and so wasting power, as current is automatically cut off on completion of charge.

The results obtained will depend upon the accuracy of the meter and the constancy of the voltage.

This method has the disadvantage that the rate of current flow is affected by the physical condition of the battery, i. e., whether the cells are short-circuited or sulphated by the temperature, level and specific gravity of the electrolyte, age of battery and on whether antimony and certain impurities are present in the cells.

It has the further disadvantage that for the best results it is probable that different terminal voltages and resistance will probably be required for each of the three different types of batteries, viz., Faure, Planté and Edison, although it is believed that very good results will be obtained if the initial charging rate (neglecting the first momentary rush of

current) does not greatly exceed the three-hour or double normal rate and the final charging rate does not greatly exceed the normal or eight-hour rate of the Planté battery.

Four methods of charging the batteries used with the head end system were considered, the following method being considered the best: A definite fixed resistance on each car is placed in series with the battery anl a definite constant voltage is maintained across both battery and resistance. The ampere hour input is determined by an ampere hour meter compensated for battery ampere hour efficiency, and when the battery is fully charged opens the charging circuit by completing the circuit through the trip coil of a circuit breaker.

The comments under the method mentioned in straight storage apply equally well here.

With the axle generator system the committee recommended a constant battery current with a voltage control, together with an ampere hour meter on each car to indicate the charge condition of the battery and show whether terminal charging is necessary.

R. Norberg of the Willard Storage Battery Company, and also a member of the committee, presented a minority report not agreeing with the method for charging straight storage batteries. He said: "I believe that a great percentage of the batteries that are actually operated are far from normal and batteries of this class would stand a great chance of getting damaged if charged according to your recommended method for straight storage.

"I have no objection to the recommendation theoretically; but I do believe that in practice it is liable to do more damage than good. I would, therefore, suggest that the recommendation be modified to such an extent as to recommend this method as theoretically the best method, where the voltage of the battery is normal and absolutely known. For practical purposes under general service conditions, method E should be recommended."

Method E is as follows: Charging current held approximately constant by manipulation of the rheostat and ampere input determined by ampere hour meter. This meter so designed as to compensate for the ampere hour efficiency of the battery when the battery is fully charged, acting to complete a circuit through the trip coil of a circuit breaker. This breaker when opened cuts the battery off charge.

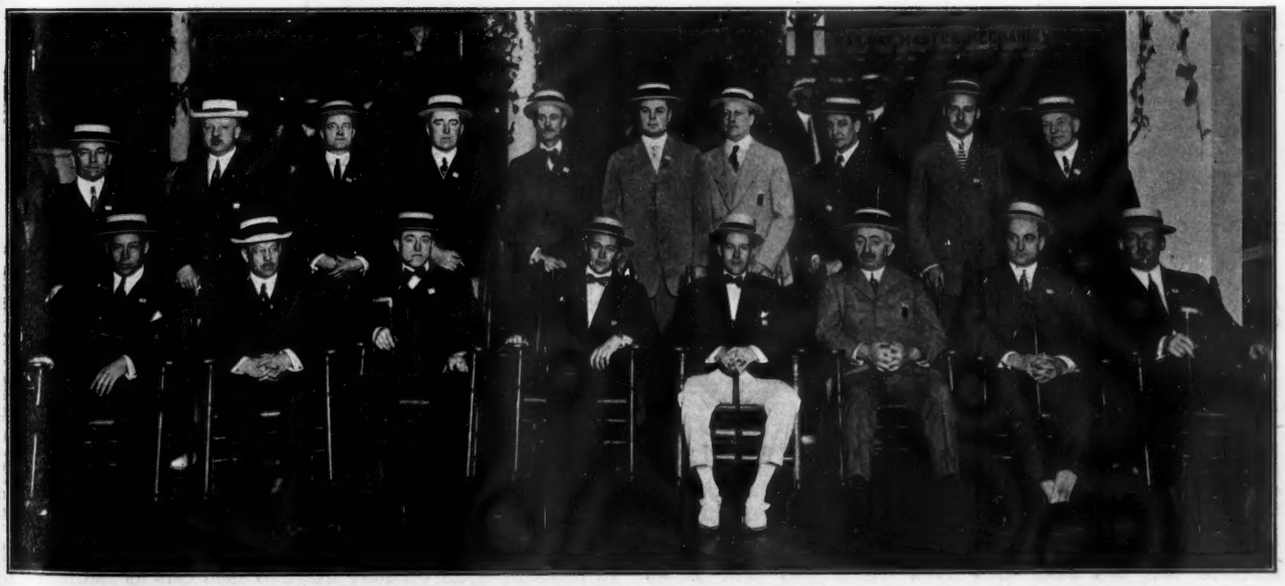
Other members of the convention agreed with Mr. Norberg. The discussion brought out the importance of the subject, as there are about 8,000,000 batteries in service which represents considerable capital. It was also mentioned that the specific gravity of the battery solution should be carefully watched.

In the report of the committee on illumination was mentioned a series of tests to be made on the Lake Shore & Michigan Southern at Collinwood, Ohio, on all types of reflectors with gas and electric lights. The tests will be very complete and will be in charge of an illuminating engineer. The manufacturers of reflectors will aid the committee in the tests.

In the afternoon S. T. Dodd, General Electric Company, gave an interesting illustrated lecture on gas-electric cars, in which he mentioned the various types of self-propelled cars. A brief historical sketch was given of these cars and a somewhat detailed description of the operation of the latest types. In regard to the fuel or distillate used for the engines he pointed out that the specific gravity specification for such fuel was not reliable, it being only an average of all the mixed distillates. A more accurate specification should be a certain percentage of distillate at one temperature, another certain percentage at another temperature, and so on until the desired blend had been obtained.

G. H. Stickney, of the lamp department, General Electric Company, and also a member of the Illuminating Engineering Society, presented a paper on illuminating engineering co-operation, whereby both the Illuminating Engineering Society and the A. R. E. E. may be greatly benefited. This may be done by joint meetings; representation by papers presented before each association; by the establishment of joint committees on co-operation and a representation of one society in the committees of the other. This scheme has been worked out with other associations with good results.

PROPOSED LINE FOR MANCHURIA.—It is proposed to build a railway from Kirin, Manchuria, to Hailungcheng via Panshihhsien. Chinese capitalists have subscribed to two-thirds of the required capital. All that is left to be done is to raise the remaining third locally, and when this sum is raised, which is, however, considered no easy task in view of the prevailing stringency in the money market, the promoters intend to start work without delay.



ENTERTAINMENT COMMITTEE.

Left to right, top row—Roger J. Faure, W. C. Wardell, H. A. Neally, J. D. Purcell, P. M. Brotherhood, J. M. Crowe, C. D. Eaton, C. J Donahue, W. S. Furry, and W. J. Caton.

Bottom row—Harry S. Hammond, L. B. Sherman, J. P. Landreth, Leonard J. Hibbard, W. K. Krepps, John D. McClintock, Gilbert E. Ryder, and Edward P. Chaffee.

MASTER CAR BUILDERS' ASSOCIATION PROCEEDINGS.

Includes President's Address, Reports on Standards, Brakes, Brake Shoes, Couplers, Wheels, Interchange Prices, etc.

The first session of the forty-seventh annual meeting of the Master Car Builders' Association was held in the Greek Temple, on Young's Million Dollar Pier, Atlantic City, N. J., on Monday, June 16, 1913.

The president, C. E. Fuller (Union Pacific) called the meeting to order at 9.30 A. M., the Rev. Dr. Newton W. Cadwell invoked the Divine blessing.

ADDRESS OF PRESIDENT FULLER

It affords me pleasure to welcome you to the forty-seventh annual convention of the Master Car Builders' Association. The Master Car Builders' Association from a small beginning has grown to be a great international institution, which is being regarded more and more as the medium upon which this whole country must rely to solve the questions of safety and permanency in methods of car construction and maintenance, and to a greater or less degree those of car operation. To hold its prestige the association must of necessity keep pace with the constant changes in affairs, and boldly step forward in the line of progress.

While we have been lending our best efforts to car construction and to the promulgation of rules which have for their purpose the minimizing of restrictions and delays in the interchange of cars, have we as an association always kept before us the necessity for taking into consideration also the question of reducing the cost of maintenance and operation of equipment? This is essential, you will agree, and it is of paramount importance that this association as a whole, and each of its committees, should weigh the cost and consider carefully the benefits attainable by their adoption before approving or advancing any changes, and especially those that will entail large expenditures.

A number of reports will be presented by standing and special committees for your consideration, and it is hoped they will be afforded careful scrutiny and be given a full and impartial discussion. Let us consider carefully all the various recommendations which are placed before us for approval, and let us not lend the prestige of this association to anything that will mean increase in maintenance and operation, which cannot be satisfactorily defended before the bar of public opinion on the grounds of safety and economic progress. While it may be true that we are surrounded by flattering conditions of prosperity, it is nevertheless true that the expenditures which our companies have been called upon to make, by reason of changes in car construction, have in recent years been enormously increased. Our watchword, therefore, should be "Economy."

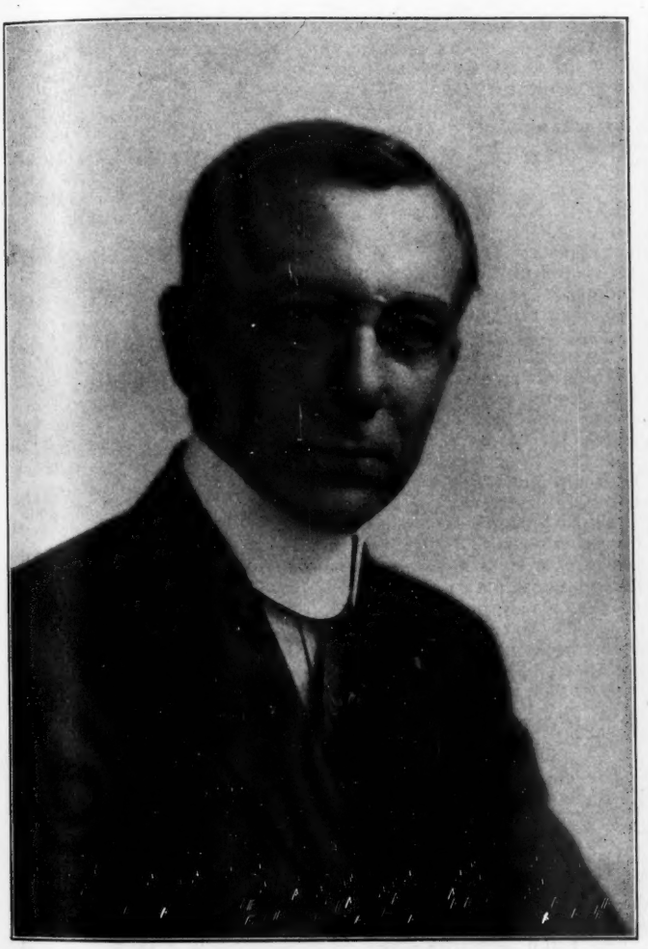
C. E. FULLER,
President, M. C. B. Association.

The committee on Standards and Recommended Practices has given very careful and exacting consideration to the problems submitted to it, and has presented a report which will be found both interesting and instructive.

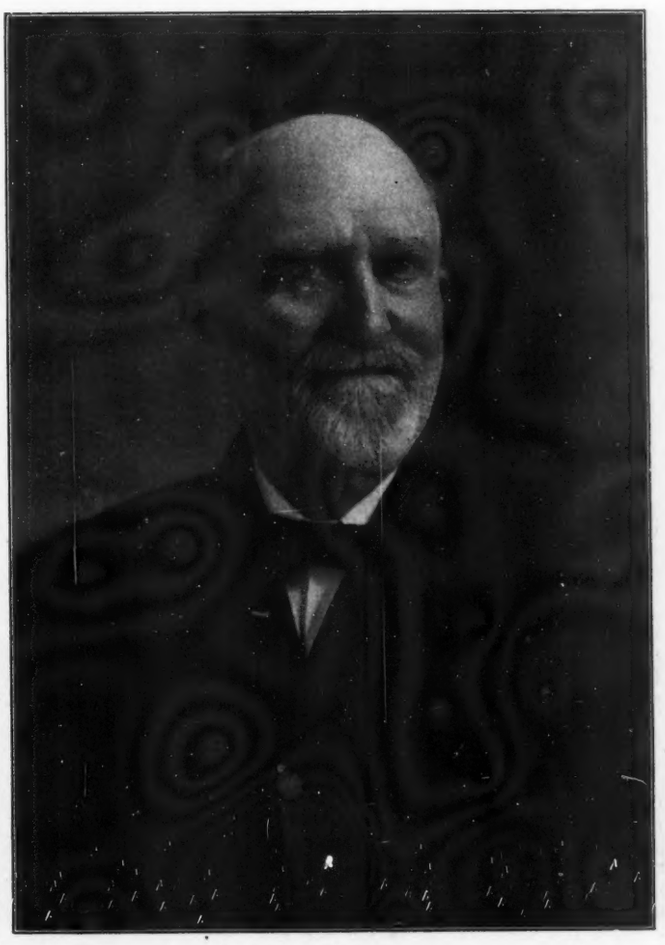
The committee on Car Construction has presented an interesting report, with appropriate recommendations to be submitted for the consideration of the members. A salient feature of this report is the determining of a limit for minimum strength of underframes. This limit is based on the minimum cross-sectional area of center sills, and, when approved, will serve as a basis to define the handling line's responsibility for combination of damages under ordinary usage to such cars as fall below the minimum strength so established. I feel that this committee should be continued, and that it should undertake to consider seriously the building of heavier capacity cars—say of 70 tons capacity—so as to increase the tonnage and enable us to reap

the benefit of reduced grades and heavier tonnage without increasing the length of our trains.

In freight car construction there has been a decided trend within the last year or so towards single-sheathed box and other house cars, indicating that this type of car is growing in favor. It has the advantage of light weight combined with strength of superstructure, comprising rolled or pressed steel shapes riveted to the underframe, but the problems of the end construction and providing for the shrinkage of lumber in the side and end lining still confront us and must receive our further attention. In view of this it seems questionable whether the solution of the entire proposition is not steel construction for freight car equipment. Speaking of steel construction, in going from wood to steel in passenger car construction probably the most important feature is that of proper insulation, which was largely neglected in the beginning, due principally to a lack of appreciation of the enormous difference between heat conductivity of steel and wood construction. Some types of early steel cars were unsuccessful from a heating standpoint; others have been made comfortable only by the addition of an unusual amount of heating surface, and the question of insulation of steel passenger cars at the present time merits our earnest study.



M. K. BARNUM,
Vice-President, M. C. B. Association.



J. S. LENTZ.
Treasurer, M. C. B. Association.

The Coupler committee has made a report which we believe is worthy of your full consideration, and especially should the question of contour lines be considered, to enable flexibility in passing around sharp curves, consequently reducing undue strains on the underframe of the car, as well as reducing the flange friction. I feel that this committee should be encouraged, and that early action should be taken to adopt a standard M. C. B. coupler.

While this association by letted ballot has adopted wheel tolerances for solid steel wheels as recommended practice, under the head of "Specification Covering Dimensions and Tolerances for Solid Wrought-Steel Wheels for Freight and Passenger Car Service," there is a possibility that this specification should go further and show the desired chemical analysis, together with the methods of test and inspection. In this connection I wish to remark that the Master Car Builders' Association is fully qualified from every standpoint to formulate its own standards and specifications, and I would recommend that a committee be appointed for the ensuing year to take this subject under consideration and make a complete report at the next convention.

With reference to the matter of light weight and maximum weight capacity stenciling of freight cars; the railroads have been rather loath to follow out the original recommendation of the association regarding this method of stenciling. The committee has been confronted with the danger that the universal adoption of the plan would possibly transfer the responsibility for failure of cars of weak construction to the handling line. At the same time it feels the necessity for recognizing the right of companies to adopt this method of stenciling for such cars as are of proper design and physical strength, to enable them to increase the carrying capacity of a very considerable number of cars without any untoward results. It is, therefore, recommended for your consideration that this stenciling be confined to steel and steel-underframe cars with a proper factor of safety in the body structure and trucks.

In the last few years the abuse of the repair card has had considerable attention at the hands of the association, and the executive committee has given this subject consideration during the past year. It is recognized that honesty cannot be legislated into the human race; however, it is believed that if the officials of the various companies will give it out plainly to their subordinates that sharp practices will not be tolerated, the complaint that some companies are making "pencil repairs" to cars wll be done away with.

During the past year the American Railway Association through its committee on Car Efficiency reported to the executive committee a serious condition at several large interchange points, brought about by the enforcement of that part of M. C. B. Rule Number 2, which requires that defect cards must be attached to cars at the time of interchange. The delays incident to the enforcement of this rule became unbearable to some companies. Cars were set back for defect cards by

both sides, and the situation became critical at some locations. It was up to the executive committee to act. It was clearly not possible to rescind that part of the rule requiring that defect cards be placed on cars. The executive committee, after due deliberation, agreed that it was absolutely necessary to reduce the number of defect cards issued. It was the opinion that this could be brought about by making some provision or arrangement, whereby the necessary repairs would be made to the cars by the handling line, so that defect cards would not be required by the receiving line; and by eliminating the carding of owner's defects. Defect cards were being issued for defects which, although primarily "owner's responsibility" became "handling line's responsibility" as soon as the car crossed an imaginary line at the time of interchange. The committee felt that there could be no possible objection raised, nor any injustice done any car owners, by placing the responsibility where it primarily belonged. Again it was a well-known fact that the prices allowed in the rules for both labor and material were not increased in recent years to meet the advances in wage schedules and the increases in cost of materials, nor did the prices in the car interchange rules include any percentage to cover facilities, supervision, or use of tools. To meet the emergency that existed the executive committee, by virtue of the authority given it by the constitution, caused circular number 8, "Result of Special Letter Ballot on Change in the Rules of Interchange" to be issued by the arbitration committee, effective November 1, 1912, by which the existing condition was almost immediately relieved. We have reliable information from several large interchange points indicating that the number of defect cards has been reduced approximately one-half.

It is a well-known fact that tht executive committee, through the arbitration committee, is called upon at times to interpret certain parts of the Interchange Rules, also to meet emergencies and to remove misunderstandings that are shown to actually exist to the detriment of prompt interchange of cars, and it has been necessary to instruct the arbitration committee to issue certain circulars to the members to meet such emergencies. Should there be any doubt in the minds of the members as to whether the reading of article six of the constitution invests the executive committee with authority to so instruct the arbitration committee, I would suggest that a committee be appointed to revise this article and remove the uncertainty.

The past year has been a particularly strenuous one for the members of the arbitration committee; their duties have been arduous and they have had some hard problems to face. I feel they are entitled to much credit and that the Association is greatly indebted to them for the work they have accomplished. I believe we can do much to lighten the labors of this committee. It has had to contend, especially in the last year or so, with cases which were based on the most trivial and technical objections; also in some instances with matters of a nature that should be settled by the contestants themselves, instead of placing the burden on the committee. It is, therefore, hoped that railroads and private car companies will refrain from placing themselves in a position where it would seem they are trying to evade payment of bills on technicalities. Another thing which I might mention under this heading is the method practiced by some roads of delaying payment of bills on technical objections. To remedy this trouble the arbitration committee will submit for your consideration a revision of interchange rule number 91 which we hope will meet with your approval.

The subject of "Salt Water Drippings from Refrigerator Cars" has been discussed for a great many years; we now have a recommended practice. At the present time the damage to track and bridges due to the dripping of brine from refrigerator cars warrants advancing this to standard, and the arbitration committee in its report this year has recommended a time after which no car carrying products which require for their refrigeration the use of ice and salt, will be accepted in interchange unless equipped with suitable devices for retaining the brine between icing stations. This subject is of such importance to the railroads that it is hoped the arbitration committee's recommendation will be adopted by the association and incorporated in the interchange rules.

There is another subject that has been receiving considerable attention of late, particularly by western roads—the retirement of cars of 50,000 lbs. and less, capacity. A great number of these cars are equipped with old style triple valves, and their physical condition as a rule is not such as to make them desirable equipment to be handled in heavy trains over steep grades. This subject will come up at the noonday discussion of topical subjects, and it is to be hoped that this matter will be fully discussed with a view to having each road confine its light equipment to local business.

The necessity of putting car roofs in proper condition is another matter, which I believe should have the attention of the association with a view to taking action that will overcome the trouble being experienced by the roads and the expense incidental to claims being paid on account of leaky roofs.

It is with regret we recall that death has taken during the past year honored members of our association as follows: W. H. Taylor, Henry Schlacks, C. E. Gossett and J. J. Ryan. A committee will be apointed to draw up suitable resolutions for record in our proceedings.

At these annual gatherings, in addition to the opportunity for exchange of ideas and absorption of knowledge, we are afforded further mental treat through the elaborate and up-to-date display of modern railroad machinery and tools which the manufacturers place before us, and I feel they are entitled to our thanks and appreciation. I would urge the members to take full advantage of the opportunity.

In conclusion I wish to express to you my sincere appreciation of the confidence you have placed in me, and assure you I feel it is a great honor to be permitted to preside over these meetings. I wish to express my deep gratitude for the assistance given me by the officers, committees and individuals during the year in conducting the affairs of the association.

ASSOCIATION BUSINESS.

Secretary Taylor then presented his report which showed the membership to be as follows: Active members, 433; representative members, 414; associate members, 11; life members, 21. The number of cars represented in the association is 2,713,650 as compared with 2,593,397 in June, 1912. Thirty-nine railroads and private car lines gave notice during the year of their desire to become subscribers to the rules of interchange governing freight cars, and three railroads advised of their acceptance of the code of rules governing the interchange of passenger equipment. The report of the treasurer, John S. Lentz, showed a balance in the treasury of $627.91. The reports of the secretary and treasurer were referred to an auditing committee consisting of T. M. Ramsdell (C. &. A.), T. J. Burns (M. C.), and E. W. Pratt (C. & N. W.).

Secretary Taylor said that on October 30, 1912, the executive committee sent the following communication to the members: In accordance with article 12, section 1, of the constitution, relating to amendments to the constitution, it is proposed that article 6, section 1, be amended as follows:

Section 1. First paragraph. No change; second paragraph, a new paragraph as follows: "The executive committee may exercise such supervision over the standards, recommended practice or rules of this association as may be necessary to meet any emergency that may arise during the year in the conduct of the affairs of the association, such action to be taken only on the unanimous vote of the members of the executive committee."

Third paragraph, revised: "It shall make a report at each convention, which shall cover the action it has taken on such general or emergent supervision and make such recommendations as it may deem necessary on questions of importance to the association."

F. W. Brazier (N. Y. C.): I move that the proposed amendment as read be approved and become part of the constitution. The motion was seconded and carried.

REPORT OF THE COMMITTEE ON NOMINATIONS.

The committee suggested the following: For President, M. K. Barnum, G. S. M. P., Illinois Central; for First Vice-President, D. F. Crawford, G. S. M. P., Penna. Lines West; for Second Vice-President, D. R. MacBain, S. M. P., L. S. & M. S.; for Third Vice-President, R. W. Burnett, G. M. C. B., Canadian Pacific; for Treasurer, J. S. Lentz, M. C. B., Lehigh Valley; for Executive Members, C. E. Fuller, A. G. M., U. P.; T. M. Ramsdell, M. C. B., C. & A.; and C. F. Giles, S. M., L. & N.

The ballot will take place on Wednesday and the tellers will be named on Wednesday morning.

REVISION OF STANDARDS AND RECOMMENDED PRACTICE.

After due consideration of present standards and recommended practice of the association, together with replies from members to the circular of inquiry, and in connection with which we wish to say that very few of same were received; also requests involving standards presented by the secretary your committee desires to report as follows:

AXLE "A." (Standard.)
With journals 3¼ in. by 7 in. Page 681. Sheet M. C. B. 15.

A member calls attention to investigation of a number of axle failures which have caused derailment on their system, and in which it has been found that they were almost entirely caused by 3¼-in. journals, worn close to the M. C. B. condemning limits. This, of course, referring only to jour-

nals with "cold breaks," as contrasted with journals "burned off."

From the foregoing it is safe to assume that the M. C. B. condemning limits for the 3¼ in. by 7 in. journals do not provide for the same margin of safety as in the larger sizes, due probably in part to the very heavy mileage that the small journal makes before reaching its condemning limits contrasted by the fact that in the case of the 5½ in. by 10 in. and to a lesser degree the 5 in. by 9 in. journals, are generally condemned by collar wear or journal length before they reach the minimum diameter.

"If this is correct, which I believe investigation on other lines will prove, the M. C. B. Association should increase the condemning limit for the 3¼ in. by 7 in. journals to give a greater margin of safety which I believe is required particularly in winter weather in the northern climates, into which district any of the cars of the southern lines are apt to pass."

The committee does not concur in this recommendation.

AXLES "C" AND "D." (Standard.)
With journals 5 in. by 9 in. and 5½ in. by 10 in. Sheet M. C. B. 15.

A member calls attention as follows:

"There are quite a number of cases of cars of relatively heavy tare weight using 5 in. by 9 in. and in some cases 5½ in. by 10 in journals. From information we have received, I believe particularly in the case of the 5½ in. by 10 in. that the journals seldom reach their condemning limits unless frequently in the 5 in. by 9 in. If it can be shown that the

T. H. GOODNOW,

Chairman, Committee on Revision of Standards and Recommended Practice.

larger condemning limit for journal diameter could be put into force without shortening the present life of these axles and that their freedom from failures even under overload has shown them to have a very considerable margin of safety, is there any reason why the permissible load carried might not be slightly increased—I believe less than five per cent. increase would be sufficient—to enable some existing equipment to carry ten per cent. overload, which is becoming generally customary, without an overload on the journal, particularly as the tendency is to increase the weight of the underframe to meet service conditions which makes it difficult to build stiff cars to carry their nominal capacity with ten per cent. overload and not overrun the journal capacity.

The committee does not concur in this recommendation.

AXLES. (Standard.)
Pages 681 to 684. Sheets M. C. B. 15 and "B."

Through a member, the following communication from Mr. George R. Henderson, consulting engineer of The Baldwin Locomotive Works, was received:

"I desire to call your attention to some investigations which I have recently made regarding the standard M. M. and M. C. B. axles in connection with the operations of the quick action ET brake under emergency application.

"There have been cases of axle failures under tenders and also there have been cases where there seems to be a tendency of the journal to roll out of the bearing or under the edge of the bearing when a severe application of the brake is made.

"Referring to the question of the strength of the axle, would say that I have investigated the combined action of the brake taken in connection with the worst strains that can occur from the natural loading and wind or centrifugal pressure, which horizontal force has been assumed at 40 per cent. or just sufficient to relieve the rail on the windward side of pressure and throw the whole load on the outer or leeward side rail. Of course this is the worst case that could occur, as any further horizontal strains would cause the car to roll entirely off the track. I find that under these conditions the greatest strains occur at the point just inside of the collar at the inner point of the wheel hub and that this strain amounts to from 22,500 to 23,000 lbs. on the 5 in. by 9 in. and 5½ in. by 10 in. axles. Of course, I see the logic in making the weakest point at this section where a crack could be discovered, which would not be the case if it occurred the other side of the collar next to the wheel hub; however, the stress seems rather high, but the action of the brake shoe coming at right angles to these stresses does not materially affect the outer strains in the axle.

"It is possible with an emergency application of the ET brake, when the brake-shoe pressure is based on 80 per cent. of the light weight of the tender with 50 pounds of air in the cylinder, in accordance with the recommendations of the Westinghouse Air Brake Co., to obtain a shoe pressure equal to about one-third of the normal axle load or maximum load for which the axle is intended. Thus, for the 5 in. by 9 in. axle the pressure horizontally of each brake shoe may amount to 10,000 lbs. under the conditions above stated and, if the tank should be practically empty, there would be very nearly enough side pressure, taken in connection with the journal friction, to roll the axle out of the bearing. In other words for the 5 in. by 9 in. axle there is a moment of 26,700 pounds disturbing force against a static moment of 30,000 pounds tending to maintain it in the bearing, and the 5½ in by 10 in. axle gives a disturbing moment of 36,700 lbs. as opposed to 40,000 lbs. of stability.

"The subject of axles rolling out of the bearings has been considered by the Westinghouse Air Brake Co., and I was recently told by W. V. Turner, the chief engineer of that company, that they were recommending double or clamp brakes on passenger equipment to take care of this trouble. This would be almost prohibitive on freight cars and tenders equipped with freight trucks and it is possible that for these conditions it would be desirable to alter the depth of the standard bearing in order to reduce this tendency of the axle to roll out of the bearing."

The committee refers this to the Committee on Car Trucks.

AXLE "E." (Recommended Practice.)
Page 683. Sheet M. C. B. "B."

A member suggests advancing axle with 6 by 11 journal, designed to carry 50,000 pounds, to standard.

The committee concurs in this recommendation.

SIGNAL LAMP SOCKET. (Standard.)
Page 802. Sheet M. C. B. 26.

In accordance with action of this Association, 1912 Convention, with respect to location of signal lamp socket in relation to exposure of Marker Lamp. The committee, after further consideration of the matter, recommends this as indicated in sketch accompanying, which is at a fixed angle of 45 degrees, and, as well, at a specified distance from the side of car to the center of socket.

MARKING ON FREIGHT EQUIPMENT CARS. (Recommended Practice.)
Page 804. Sheet M. C. B. "G."

A member suggests that this be advanced to standard, and sheet M. C. B. *G* corrected as to location for marking United States Safety Appliances Standard.

The committee concurs in this recommendation.

MARKING ON FREIGHT EQUIPMENT CARS. (Recommended Practice.)
Page 805. Sheet M. C. B. "G."

The attention of your committee was called to American Railway Association Car Service Rule No. 11, as revised November 20, 1912, which has reference to the weighing of freight equipment, and omits the star indication, with recommendation that the Recommended Practice of this Association be changed to conform.

The committee concurs in this recommendation.

MARKING ON FREIGHT EQUIPMENT CARS. (Recommended Practice.)
Pages 804-805. Sheet M. C. B. "G."

Through the secretary of the association was referred the suggestion of a representative of the American Railway As-

sociation for a standard for stenciling on cars of date of building, on account of the requirements in regard to the reweighing of cars.

The committee concurs in this recommendation, and suggests that the word "new" be stenciled preceding the word "weight," in accordance with the American Railway Association Car Service Rule No. 11, as amended November 20, 1912.

SPRINGS AND SPRING CAPS FOR FREIGHT CAR TRUCKS. (Recommended Practice.)

Page 903. Sheet M. C. B. "H."

A member suggests adding a spring for the 140,000-capacity freight car truck.

The committee concurs with the recommendation, and refers same to the Committee on Car Trucks.

CLASSIFICATION OF CARS. (Recommended Practice.)

Pages 906-913.

Through the Secretary, request from Mr. G. P. Conard, Secretary of the Association of Transportation and Car Accounting Officers, for assignment of designating symbols for equipment, was received, as follows:

"BM"—MILK CAR.—Exclusively for the transportation of milk, being a car for this purpose and fully equipped for handling in passenger trains.

"ES"—ELECTRIC PASSENGER CAR.—For long hauls or suburban service; multiple unit, and fitted with automatic couplings and air brakes. Operating power, storage battery.

"GB"—GONDOLA CAR.—A car with solid bottom, sides and ends, and open on top; suitable for mill trade.

NOTE TO FOLLOW CLASS "H."

If any of these hopper cars are provided with roof or cover for protection of contents, the letter "R" should be affixed to the regular symbol to designate its special class of service.

"MBE"—COMBINATION, BAGGAGE, MAIL AND EXPRESS CAR. A car having three compartments, each entirely separate from the other for handling its individual class of business.

"MPB"—COMBINATION, BAGGAGE, MAIL AND EXPRESS CAR. A car having an individual compartment, each entirely separate, one suitable for mail, one suitable for baggage, and one suitable for passengers.

"XI"—BOX CAR, INSULATED.—A box car having walls, floor and roof insulated, not equipped with ice bunkers or baskets. This car ordinarily used for transporting vegetables, freight, etc.

"MWX"—BOARDING OUTFIT CARS.—This includes cars used for boarding' sleeping, or cooking purposes in construction and similar work.

The committee concurs and assigns symbols as indicated.

A member suggests assigning designating symbols to the following class of equipment:

Symbol.	Kind of Car.	Description.
"MWE"	Ballast Spreader and Trimmer.	A car with blades or wings for spreading or trimming ballast.
"MWJ"	Ballast Unloader.	A car equipped with machinery for pulling a plow through cars loaded with ballast.
"MWP"	Pile Driver.	A car equipped with machinery for pile-driving.
"MWK"	Snow Removing Cars.	Cars equipped with any special device for removing snow from between or along side of rails.
"MWM"	Store Supply Car.	A car equipped for handling material to be distributed for railway use.

Following the heading of "General Service Freight Equipment Cars," note to be added, as follows:

Any of the following classes of equipment having special heating appliances for the protection of commodity against freezing, to be covered by affixing the letter "H" to the designating symbol.

"SH"	Horse Car.	A car specially fitted for the transportation of horses in freight service.

The committee concurs in the recommendation, so far as designating symbols are assigned.

NEW SUBJECTS.

The committee has further considered the establishment of a maximum standard or limiting height for the running board of a standard dimension box car, and in view of the variance found, brought about to meet traffic requirements, we do not feel warranted in recommending a standard height for running board in view of the other conditions which enter in connection with this.

A member suggests the necessity for a journal box, brass and wedge for axle with 6 in. by 11 in. journals, so as to complete the Association's approval of the use of an axle with 6 in. by 11 in. journal in freight service.

The committee concurs and refers this to the Committee on Freight Car Trucks.

A member calls attention to difficulty experienced with cars with arch bar trucks, or trucks with rigid side frames, and having side bearings located outside gauge of track, and suggests establishing a standard spacing for side bearings.

The committee concurs in this recommendation, with the suggestion that the maximum side bearing spacing should not exceed the rail gage, with a minimum of 44-inch centers, and a minimum clearance between side bearings of 3/16 inch.

A member calls attention to the necessity of end doors on account of difficulty experienced in having yard clerks obtain seal records of same, due to the inconvenient location and risk of personal injury. Claims are now being paid on account of no end door seal record, and cars are being pilfered by theft through the end doors, which can be entered with the least chance for detection. Is an end door in a standard box car essential? If so, could it not be placed near the side of car where seals could be read from the side ladder?

The committee refers this to the Committee on Car Construction.

The committee, at this time, wishes to submit for consideration, separating the proceedings of the association as at present published, taking out the standards and recommended practice, and have same published as a separate volume.

The report is signed by:—T. H. Goodnow (C. & N. W.), chairman; C. E. Fuller (U. P.); W. H. V. Rosing (St. L. & S. F.; W. E. Dunham (C. & N. W.); O. C. Cromwell (B. & A.); T. M. Ramsdell (C. & A.), and O. J. Parks (Penna.).

During the presentation of the report the chairman stated that the committee wished to withdraw the article referring to Signal Lamp Socket.

T. H. Goodnow (C. & N. W.): Since this report was drawn up, the committee has received several other suggestions, which we could not handle on account of the report having been completed and sent in to the secretary for printing, but at a meeting of the committee held this morning, it was decided that there would be included and presented now, as a supplemental report to the convention, the suggestion made by the arbitration committee that the recommended practice on the Collection of Salt Water Drippings be advanced to standard.

DISCUSSION.

D. F. Crawford (Penna. Lines): I would like to ask the chairman of the committee a question. On page 9, in reference to the marking of freight equipment cars, recommended practice, page 804, sheet M. C. B. G, the suggestion was made that on account of the numerous markings which we are compelled to put on the cars a badge plate with small letters be permitted and used as the recommended practice of the association. I notice that a number of railroads, as well as our lines, are building house cars with considerable outside framing. It is a single sheet car with steel frame. This steel frame makes it extremely difficult to put on the car all the markings which are required, in the comparatively large letters required by the recommended practice of the association, and I would like to know what the objection is to putting on a badge plate.

T. H. Goodnow: I believe it was considered that the present markings were practically established in connection with the meeting which was held with the Interstate Commerce Commission inspectors; that it was thought that on account of that they ought to stand at present as included in the proceedings. The Committee did not feel there would be an objection to using the other, but at the same time, on account of the situation it brought about with the present standard in the proceedings, it had better be left as it is.

D. F. Crawford: The marking of the government is United States Safety Appliance Standard, and they permit the use of the badge plate. The other markings, such as the size of the shank of the coupler and the character of the triple-valve, I do not think the government is particularly interested in.

W. E. Dunham (C. & N. W.): I would suggest that the recommendation indicated that all the markings were to be taken care of by a badge plate. We did not feel that was advisable; the general marks on the car we do not think should be reduced to badge plate sizes.

T. H. Goodnow: In connection with Mr. Dunham's remarks, if I recollect rightly, the only samples submitted were United States stenciling.

D. F. Crawford: That is all covered by page 105, which reads that a badge plate 3½ in. x 10 in., with proper marking, may be used instead of penciled stenciling. The technical point may be raised that a great many cars now turned out with the information regarding the air-brake, coupler and brake-beams and other information of that kind, are all turned out with badge plates. I would suggest a modification of that section of the report.

D. R. MacBain (L. S. & M. S.): It seems to be a good thing to concur in Mr. Crawford's remarks.

M. K. Barnum: It seems to me it would be a good thing to request this committee to consider the markings now placed on the outside of the cars with a view to separating them into two classes, one to be put on a badge plate and the other class to be stenciled on the car in a suitable manner. I would make that as a motion, that the committee be requested to revise that part of their report under those instructions; and that they separate the different items that

now are placed on the outside of the cars, making two lists, one of which may be placed on a badge plate and the other stenciled on the cars in the proper manner.

C. A. Schroyer (C. & N. W.): Why is it necessary to incorporate that in the recommended practices of the association when it is now permissible, and nobody will be able to tell as to whether it goes on with a badge plate or is stenciled on.

M. K. Barnum: I think it is necessary in order to have uniform practice.

C. A. Schroyer: It seems to me that there would be no uniform way if the matter is left permissible; "may be" does not make it a uniform practice, because we would not like to pay sixty or seventy cents for a badge plate when we can put it on with one cent's worth of paint. If we want to do it, we have the privilege under existing conditions.

D. F. Crawford: If this particular paragraph had not been entered and had been ignored by the committee, I would not have raised the point; the committee raised that point.

T. H. Goodnow: This was submitted to the committee to be considered, they had to consider it, and for that reason it was incorporated in our report.

President Fuller: The point submitted was the safety plates; they only refer to that.

D. F. Crawford: That is already covered and is a standard of the association.

C. A. Schroyer: I want to make a motion, as an amendment to this amendment, that that portion of the committee's report be stricken out entirely, and the standards and recommended practice will then remain as they are now, which will permit a railroad to use the badge plate if desired, or to put the lettering on with paint if desired.

President Fuller ruled that the motion was not in order at the time.

C. A. Schroyer: When will my motion be entertained?

President Fuller: If the motion made by Mr. Barnum is defeated, your motion will be in order.

C. A. Schroyer: Then there will be no occasion for my motion.

T. H. Goodnow: Yes there will, because that will allow the report to stand as at present.

President Fuller.: The question is on Mr. Barnum's motion. The motion was lost.

President Fuller: The motion made by Mr. Schroyer is now in order.

C. A. Schroyer: I make that as an original motion and not as an amendment.

E. W. Pratt: It occurs to me there is no provision in our rules for badge plates except for the words "Safety Appliances," or "Safety Appliances Standard." On the contrary, it tells us the letters for all dimensions of cars and capacities, and everything else, and therefore the standards of the association apply to nothing but that one particular item. We have not anything if we carry this motion, because it will not apply to the matter which we have in hand.

W. F. Kiesel, Jr. (Penna.): I would like to suggest as an amendment to that motion that the committee be requested to make standard plans for badge plates which can be used as a substitute for the stencil for such parts, if the badge plates are available.

President Fuller: Mr. Schroyer, will you accept that amendment?

C. A. Schroyer: No, I am not inclined to accept that amendment.

T. H. Goodnow: It seems to me this committee cannot handle Mr. Kiesel's recommendation, as we simply handle the standards. The standards are established as to the style and size of letter and their location, and it is not within the province of this committee to take up the work that Mr. Kiesel proposes; that is for some other or some special committee to handle.

W. F. Kiesel, Jr.: Your committee can refer the matter to some other committee for consideration.

T. H. Goodnow: That will delay the matter another year.

W. F. Kiesel, Jr.: Let it be delayed another year.

E. W. Pratt: You can make one amendment to an amendment, and I amend Mr. Kiesel's motion to the effect that this suggestion be made by the convention to the executive committee, and that the executive committee put this matter into the hands of such committee as they deem proper. That will save a year's delay.

C. A. Schroyer: I accept the amendment.

The amendment was carried.

President Fuller: By the action just taken, it is understood that this report will go to letter ballot for adoption as recommended practice, and the amendment just made by Mr. Pratt will be considered by the executive committee.

TRAIN BRAKE AND SIGNAL EQUIPMENT.

The committee recommends that hereafter all freight cars weighing between 37,000 and 58,000 lbs. be equipped with 10-in. brake cylinders. The committee also believes that the braking power for freight equipment should be made 60 per cent. of the light weight of the car, based on fifty pounds per square inch cylinder pressure. With 10-in. brake cylinders applied to cars coming under the weight limits given, and using the braking power recommended, a total leverage ratio of 9 to 1 need never be exceeded.

The committee corresponded with the air brake companies for the purpose of ascertaining what triple they would recommend for all freight car equipment to be considered as standard. The replies received stated that they would suggest K-1

R. B. KENDIG,
Chairman, Committee on Train Brake and Signal Equipment.

for 8-in. and K-2 for 10-in. equipments as the one to choose for a standard. The advantage to be derived from the adoption of a standard triple valve for all freight equipment and the elimination from service of several different types are so obvious that the committee does not hesitate to recommend that the K-1 and K-2 triples be made the standard for freight cars.

On account of the increased weight and length of passenger trains, the highest degree of perfection in the operation to obtain uniform application and to avoid annoyance from sticking brakes in releasing is more necessary now than ever before. The committee having before it a report of the results of tests made by the Westinghouse Air Brake Company to de-

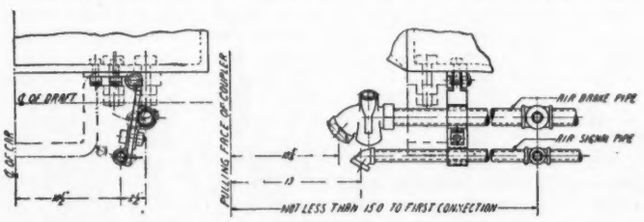


Fig. 1.—Proposed Swing Hanger for Air Brake and Air Signal Pipes at End of Passenger Train Cars.

termine the effect on brake operation of various internal diameters of brake pipe, recommends that no pipe having an internal diameter less than that of 1-in. standard weight be used on passenger cars, and that for all new equipment 1¼-in. extra-heavy pipe be used.

In the case of modern passenger cars, the committee believes that the ends of the brake pipe should be supported by swinging clamps and hangers, so that no trouble from hose parting while train is passing through crossovers will be experienced. Fig. No. 1 illustrates a swinging brake and signal pipe end hanger that has given good service for over two years.

The action of acids and salt water drippings from coal and refrigerator cars falling onto the brake pipe and its fittings causes them to deteriorate rapidly, and it has been suggested

to this committee that the brake pipe on such cars should be galvanized to protect them. This practice is recommended.

There appears to be a lack of uniformity upon the various railroads in the use of a standard socket or pipe coupling, located 10 in. back of the angle cock in the brake pipe. These sleeves or sockets are furnished in various weights and lengths by different manufacturers, and where short ones are used there is more likelihood of leakage. The committee recommends that Sheet No. 18, showing location of brake pipe, be revised or amplified so as to show a pipe nipple, extra strong, 11½ in. in total length, and a line pipe coupling, extra heavy, 2⅞ in. long, the distance between the angle cock and pipe coupling to remain the same as at present—10 in.

The position of bolting lugs of hose clamps as shown on Sheet Q interfere with the operator's hand when operating the angle cock, and at the coupling end with the steam hose where cars are equipped with both the air and the steam lines. In Fig. 2 is shown the locations of the clamps as the committee believes they should be. The committee believes an M. C. B. specification, providing for the proper application of the clamps to the hose, should be prepared and the drawings on Sheet Q be changed to conform to it.

On account of not carrying out the recommendation made by the committee last year for the adoption of a distinctive hose label, the rearrangement shown on Sheet Q costs more to apply, and, therefore, the committee recommends the design of hose label shown on Fig. 2 for adoption.

There are also many other important brake matters that should be investigated and reported upon, such as Foundation Brake and Gear and Clasp Brakes for Heavy Passenger Equipment, Proper Location of Ends of Brake Pipe with Reference to Pulling Face of Coupler, Distance of Brake Pipe

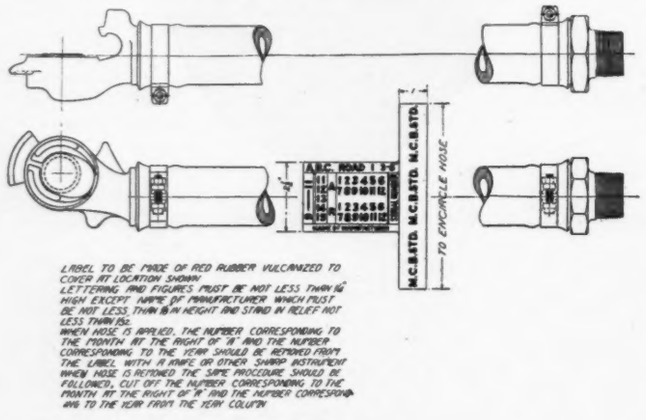

M.C.B.STD. M.C.B.STD. M.C.B.STD.
TO EXCEED 1 1/2
LABEL TO BE MADE OF RED RUBBER VULCANIZED TO COVER AT LOCATION SHOWN
LETTERING AND FIGURES MUST BE NOT LESS THAN 1/8 HIGH EXCEPT NAME OF MANUFACTURER WHICH MUST BE NOT LESS THAN 1/8 IN HEIGHT AND STAND IN RELIEF NOT LESS THAN 1/32.
WHEN HOSE IS APPLIED, THE NUMBER CORRESPONDING TO THE MONTH AT THE RIGHT OF "A" AND THE NUMBER CORRESPONDING TO THE YEAR SHOULD BE REMOVED FROM THE LABEL WITH A KNIFE OR OTHER SHARP INSTRUMENT WHEN HOSE IS REMOVED THE SAME PROCEDURE SHOULD BE FOLLOWED, CUT OFF THE NUMBER CORRESPONDING TO THE MONTH AT THE RIGHT OF "A" AND THE NUMBER CORRESPONDING TO THE YEAR FROM THE YEAR COUPON

Fig. 2.

from Center of Car Coupler and Height from Rail. The members of the association are earnestly requested to submit to the committee at as early a date as possible matters such as they consider deserving of attention that pertain to the work of the Train Brake and Signal Committee, so that ample time may be had to deal thoroughly with them.

The report is signed by:—R. B. Kendig (N. Y. C.), chairman; R. K. Reading (Penna.); B. P. Flory (N. Y. O. & W.); E. W. Pratt (C. & N. W.) and L. P. Streeter (Ill. Cent.).

B. P. Flory, N. Y., O. & W., presented the report in the absence of the chairman, R. B. Kendig, and in connection with Section Eight, under the heading "The M. C. B. Hose Label," said: Since this report was printed and distributed, we have received a report from the committee on Air-Brake Hose Specifications, showing another label, and it was thought by our committee that the discussion on this particular part would be better left out until the time when the committee on Air-Brake Hose Specifications comes up, as the two labels are quite different.

DISCUSSION.

W. E. Durham (C. & N. W.): I do not quite appreciate why the committee has recommended item Number 3, to the effect that 1¼ in. extra heavy pipe be used. It seems to me standard 1¼ in. pipe would answer all purposes and certainly would not be as expensive.

D. C. Young (Penna.): In regard to section 2, I would like to ask the committee in submitting this question to letter ballot, when it would become operative as a standard of the association. If it was passed, it would seem to me a great many triple valves would have to be removed from freight cars, that would be perfectly good for service. Therefore, it seems to me, the committee should name some date when this standard would become effective in reference to the question of the application of the valves.

C. A. Schroyer (C. & N. W.): I would say in that connection, it is only in the past few years that we have had a 10 in. cylinder for freight cars. We have a great many hundred freight and refrigerator cars now equipped with an 8 in. cylinder, and this recommendation would knock the whole thing right out. The trouble is, if this association goes on establishing standards, they will cut out our cars; in interchange, this would all have to be cut out, or spend $40. or $50 in brakes. In this, they allow a latitude of 37,000 to 58,000 lbs. on a 10 in. and it cuts down the 8 in. to everything below 37,000; and a large majority of the cars we have in service for freight are between 28,000 and 36,000 lbs.; so now we only have 8,000 limit for 8 in. brakes and 21,000 limit for the 10 in. brakes. It seems to me we should be very careful about this.

E. W. Pratt (C. & N. W.): These have been the recommended appliances of the air-brake companies for several years, and most of the railroads, all the up-to-date railroads, have been adopting these recommendations of the air-brake companies; and this was simply to emphasize that. If it is a recommended practice, it would apply to new equipment for some years to come, and yet be a standard for the association.

C. D. Young: We are one of the up-to-date railroads using the 10 in. cylinder and the K-2 triple valves; but this would apply to all the existing cars with 8 in. cylinders and plain triple-valves; therefore the triple-valves would have to be removed and K-2 triple-valves substituted for them, and I think if the committee would let it apply to new cars built after January 1, there would hardly be any objection to their recommendation. I make such a motion.

C. A. Schroyer: The loss comes in in this respect—the law compelled us to fit up these cars, commencing in 1893. We, as an association, recognized that there is no deterioration in an air-brake, and we allow none when we settle for one. All the cars we are destroying to-day have 8 in. air-brake cylinders on them, all of which are good and usable hereafter; and we have to throw them away and scrap those brakes.

B. P. Flory (N. Y., O. & W.): The committee says K-1 and K-2 standard. I think the word "standard" was hardly the intention of our committee, and it should be "Recommended Practice," and that this matter should be referred to as recommended practice, and for that only. That would, I think, cover all the objections raised.

The motion was seconded and carried.

O. C. Cromwell (B. & O.): I notice in number 5, the last paragraph, that the length of the nipple has been changed from 10 in. to 11½ in. A-1, the M. C. B. cuts specify the 10 in. nipple. Why should we make that change?

E. W. Pratt: The chairman of the committee gives me that information, and asks me to explain it. The M. C. B. cut shows from shoulder to shoulder; this refers to the length of the nipple, including threads, so they are practically identical.

O. C. Cromwell: It simply specifies the 10 in. nipple and shows no points between which the length extends.

President Fuller: On M. C. B. sheet 18 it says 10 in., and the arrow-points show between the fittings.

C. A. Schroyer: Then it would mean an 11½ in. nipple. I think it is all right.

O. C. Cromwell: If you order a 10 in. nipple. you won't get it between the collars. You put in a requisition for a 10 in. nipple; it would be the total length and that is the way it was intended to be in these proceedings.

President Fuller: It does not show it.

O. C. Cromwell: It specifies a 10 in. nipple; and that means full length.

F. F. Gaines (C. of Ga.): We have been at some trouble at getting at a standard nipple, and I think we should stick to what we have.

President Fuller: Does anybody know what they are using?

O. C. Cromwell: We use a piece of pipe 10 in. long.

F. W. Brazier (N. Y. C.): A 10 in. nipple is but 10 in. and not 11. If it is an error in the drawing, would it not be easier to correct that?

O. C. Cromwell: If the drawing shows 10 in. from shoulder to shoulder, it does not show a 10 in. nipple.

W. E. Dunham (C. & N. W.): I make the motion that the cut be corrected to show a 10 in. nipple.

President Fuller: Ten inches in length?

W. E. Dunham: Yes, sir. a ten inch nipple.

O. C. Cromwell: You will have to show how many threads will go into the nipple.

The motion was carried.

T. H. Goodnow: As I understand it now, the nipple is taken out of this report, is it not?

President Fuller: The plate will be corrected to show a 10 in. nipple instead of 10 in. between shoulders.

M. K. Barnum (Illinois Central): I move that this report

be adopted as revised, with the exception of paragraph 8, referring to the Hose Label which shall be omitted and deferred for discussion until the report of the committee on Air-brake and Hose Specifications is taken up.

The motion was seconded and carried.

BRAKE SHOE AND BRAKE EQUIPMENT.

BRAKE SHOES.

The committee would repeat the recommendation of last year, namely:

"That some further work be undertaken by the association for the purpose of connecting the results obtained under high brake-shoe pressure with those upon which the association's specifications are based."

Previous to 1911 the tests on brake shoes had been confined to pressures of 2,808, 4,152, 6,840 and 12,000 lbs., and to speeds of 20, 40 and 65 m. p. h.

The tests made by the committee in 1910 at a speed of 80 m. p. h., and at pressures of 9,000 12,000, 14,000, 16,000, 18,000 and 20,000 lbs., established new standards for high-pressure and high-speed service.

In order to complete the series and to furnish data for high-pressure specifications, it is desirable that some further tests of an intermediate character should be made on the shoes tested in 1910.

The committee accordingly recommends for this year's program tests on these same shoes at a speed of 65 m. p. h. and at pressures of 9,000, 12,000, 14,000, 16,000 and 18,000 lbs.

The pressure of 20,000 lbs. is not included, since the results obtained in 1910 show that no practical advantage attends the use of pressures higher than 18,000 lbs.

The committee further recommends that from the data thus obtained specifications should be prepared covering the use of shoes in heavy passenger work.

In view of what has been said above, the committee feels that further tests should be made to complete the series and render available for the purposes of the Association the high-pressure work already done.

The committee presented an Appendix showing results of tests made by the New York Central Lines at the laboratory of the American Brake Shoe & Foundry Company, Mahwah, New Jersey.

BRAKE-BEAM EQUIPMENT.

Standard Brake Beam.—The recommendation of the committee in regard to the adoption of standard No. 2 brake beam was rejected. In order to ascertain the reasons for this rejection, and to get further information, the committee addressed a circular letter of inquiry to the members. The replies to this letter as received by the committee have led the committee to make certain changes in Sheet 17-B, as follows:

The hole at the lower end of strut member in Sheet 17-B is drawn dotted as being optional. It will be noted that the hole in the upper end of the head is also dotted. The committee has found by investigation that it will be difficult to reduce the weight of the beam shown in Sheet 17-B enough to make any appreciable saving without the probability of stresses in the compression member, which would be unsafe for commercial open-hearth steel. The committee would indicate that the new brake-beam gage shown in Sheet 17-A was accepted for trial, with a view to adoption as recommended practice by letter ballot. The committee would accordingly recommend Sheet 17-A to be accepted as showing the details of the gages under trial.

The committee would also recommend the beam as shown on M. C. B. Association Sheet 17-B for consideration and trial by members of the Association, with a view of adopting such beam as recommended practice for No. 2 M. C. B. brake beam.

Brake Beams for Passenger Equipment Cars.—In the circular letter the committee asked whether it was desirable to prepare specifications for the test and inspection of brake beams to be used on passenger train cars. The vote on this question was indeterminate. The committee would ask of the Association, therefore, an expression of opinion as to the advisability of preparing a specification for a brake beam for passenger train cars.

Spacing of Brake-beam Heads.—In the opinion of the committee, the spacing of 60¼ in. between the brake beam heads is unnecessarily large and allows the brake beam to shift to one side or the other and to bring the brake shoe on one side beyond the tread of the wheel so as to bear on the outside edge and wear to a shoulder. This can easily be demonstrated by comparing the maximum and minimum distances for brake heads with the standard maximum and minimum gages of wheels. The committee would accordingly recommend that an average spacing of 60 in. be adopted in place of 60¼ in., with a maximum spacing of 60⅛ in. and a minimum of 59⅞ in.

The report is signed by:—Prof. Chas. H. Benjamin (Purdue Univ.), chairman; C. D. Young (Penna.), and R. B. Kendig (N. Y. C.).

In connection with the matter of further tests to be made, Prof. Benjamin in presenting the report, said: "I will say in explanation, that the association, for the past two years, has authorized these tests but unfortunately we have not been able to obtain the money with which to complete them. I hope that the association will continue this recommendation and that we may be able this year to make the tests. This will practically complete the work on the tests of brake-shoes for this purpose, and will make our specifications complete."

DISCUSSION.

President Fuller: It is considered best to take up the discussion on the brakeshoes first, and go to the brakebeam equipment afterwards.

F. F. Gaines (C. of Ga.): I would move that the recommendation of the committee be adopted, that is, that further tests be made according to the sections on brakeshoes which have been outlined.

The motion was seconded and carried.

Prof. Benjamin then presented the portion of the report relating to brakebeam equipment, and after reference to the beam, as shown on M. C. B. sheet 17-B, for consideration and trial by members of the association with a view to adopting such a beam as recommended practice for a No. 2, M. C. B. brake-beam, he said: "Another question which was raised was that of making the head stronger; that is, re-enforcing the back of the head, for the reason that the steel-back brakeshoe sometimes breaks in the middle, and brings the pressure on the head in such a way as to subject it to more stress than it was intended for. The committee has considered this point, and would prefer to reduce the clearance which now exists from 1/16 in. to 1/32 in., which would perhaps remedy the difficulty without any change in the size of the head."

After the paragraph headed Brakebeams for Passenger Equipment Cars, Prof. Benjamin said: "The reason for asking this was that the answers to the circular of inquiry were so few and indefinite that the committee got no information, and we would like to have the matter referred to the association for an expression of opinion. In this connection, the Buckeye Steel Castings Company, whose exhibit is located at Booths 603-605 of the annex, has kindly consented to exhibit a brakeshoe with the wheels and brakebeams, so that members can make these comparisons directly on a wheel. The brake is so arranged that the wheels on one end have a maximum spacing and maximum thickness of flange, while on the other end they have a minimum spacing and minimum thickness of flange. There are three brakebeams available, one averaging 59¾, one 60, and one 60¼. These will enable all members who are interested in this to see what the tolerances are and satisfy themselves as to the position which the brakeshoe is liable to have, and as to how much motion it has one way or the other."

After the paragraph on Spacing of Brake-Beam Heads, Prof. Benjamin said: "In supporting this last recommendation, I would say that the increasing accuracy in standardization of the wheels and axles themselves makes it more practicable to limit the spacing of the brake-heads in this way than five or ten years ago."

President Fuller: Some action should be taken on the recommendations of the committee under section 3 reading "That the question of preparing a specification for a brake beam for passenger train cars be submitted to the membership of the association for letter ballot." The committee would like the views of the members on this proposition.

O. C. Cromwell (B. & O.): I move that the committee be instructed to prepare such specifications and present them to the association.

(Motion seconded and carried.)

F. F. Gaines (C. of Ga.): I would like to move that recommendation Number four as to its spacing of 60 inches for brake beam heads be adopted as standard and referred to letter ballot.

O. C. Cromwell: I do not think that our present standard should be changed. If you investigate this matter, you will find that you have, with 60 inches at the centre of the head, a ¾ in. clearance between the shoe and fillet of the flange. It is a much more serious matter wearing out the throat of the flanges than wearing the shoes on the outside of the trend. You have established a centre now of 60-¼ in., you have a gage for it, and the suspension on the trucks is arranged for that; you have the hangers for it, and why go away from it? I cannot see any great necessity for it. We have no trouble with the

shoes sliding off from the outside treads where we run 60-½ in.

F. F. Gaines: I want to say that our experience has been with the wider gages, 60-½ and 60-¼. We find more throat wear due to the wide gage where the shoe will loop over the face of the opposite side and bring the other shoe tread up into the throat of the wheel, and that will wear the shoe out much more quickly. I would like to see the matter go to letter ballot this time.

The motion of Mr. Gaines was put to a vote and carried.

F. F. Gaines: In reference to recommendation No. 1, this motion we have just put involves a change of sheet 17-A, in regard to the spacing of 60¼ in. there, and I just call the attention of the committee to it. With that in view, I move that the recommendation of the committee be submitted for adoption as standard. It says 60¼ and will have to be changed to 60, if section 4 is adopted according to the recommendation of the committee.

President Fuller: Your motion carries with it a change of the standard, and the matter is before the association for vote by letter ballot for adoption as standard. If section 4 is adopted, it will be necessary to make some changes in other sections to agree therewith.

F. F. Gaines: I move that we adopt recommendation Number 1 as standard, with the change to 60 in., as called for by the other motion.

The motion was adopted.

R. L. Kleine (Penna.): I move that recommendation number two be submitted to letter ballot for adoption as recommended practice.

A. W. Gibbs (Penna.): As I understand the matter, we are not clear on the subject of patents in connection with that brake gearing.

President Fuller: This matter which we are discussing relates to brake beams.

A. W. Gibbs: Recommendation number two says "That No. 2 brake beam, shown in sheet 17-B of this report, receive consideration and trial by members of the association, with a view of adopting such beam as recommended practice for No. 2, M. C. B. brake beam." In that sheet is shown the brake head. The brake head, I find out from reports from one of the legal associations, is covered by two patents, both of which are controlled by the same company, and that the important one is described as follows: "The Harrison patent is the more important one, and covers a brake head having broad attaching lugs with chambered legs, the lugs being cored transversely of the keyway, giving the advantage of strength and uniformity of casting, besides certain alleged incidental advantages in manufacture. The important thing is that this patent contains a claim (No. 6) reading 'A brake head having a shoe attaching lug, extending from side to side of the brake head, said lug having a broad bearing face of substantially rectangular shape and uniform width, the leg portions of said lug being chambered at each side of the key-hole of the lug.'"

President Fuller: Can you enlighten us on this matter, Prof. Benjamin?

Prof. Charles H. Benjamin: This matter regarding the patent was called to my attention subsequent to the preparation of the report by Mr. Gibbs, and I wrote to the person who owns this patent, asking what his attitude would be, and received simply a non-committal letter as to the attitude with regard to making this public property. If it is the pleasure of the association, I will read the letter.

Prof. Benjamin: The committee had not intended to precipitate this discussion before the association, but as long as it is before the house, the committee feels bound to give the association all the information in its power.

R. L. Kleine: Inasmuch as the subject before us involves a patent, I suggest that it be referred to the executive committee, in accordance with the constitution, rather than that the matter shall be discussed here on the floor.

President Fuller: That will delay the action on the report of the committee, unless you cut out the head entirely.

R. L. Kleine: I would have to withdraw my motion, under those conditions.

E. W. Pratt: It seems to me that the angle this discussion has reached is something like our standard coupler discussion, and if it would be agreeable to the ideas of the committee, it would seem to me to be a good thing if this association would refer this standard brake beam back to the committee, and the committee be requested to confer with the manufacturers, as well as the coupler committee, and report at the next convention.

C. D. Young (Penna.): I believe that by a slight addition to sheet 17-B, which was prepared in my office, any question of patent arrangements can be easily handled by the executive committee. I believe the matter can then be voted on as recommended practice. I am of the opinion that by a slight change in the drawing, which will not affect in any way the interchangeability of the head with the channel or the head with the tie member, that the whole thing can be settled this year, and I would make an amendment to Mr. Kleine's motion that this question of the patent situation, agreeable to the executive committee, be disposed of before this matter is submitted to letter ballot.

Mr. Kleine accepted the amendment and the motion was carried.

COUPLER AND DRAFT EQUIPMENT.

COUPLER TESTS—STATIC AND DYNAMIC.

The tests outlined in report of last year were conducted by the Pennsylvania Railroad under the direct supervision of C. D. Young, engineer of tests and the chairman of the committee. These tests were started April 3, 1912, and carried along continuously, using Pennsylvania Railroad testing facilities, as well as those of the Baltimore & Ohio, the Baldwin Locomotive Works and the Pressed Steel Car Company to expedite the work, and were completed April 24, 1913. A total of 481 tests were made.

The couplers used in these tests comprised those in general use to-day, as well as some reinforced or strengthened couplers which were in course of development, as follows: Pitt, Major, Latrobe, Major Special 103, Gould "Z," Janney "X," Sharon, Krakau, Alliance, Bazeley and Simplex.

With a view of increasing the elastic limit and ultimate strength of the material, experiments were made with heat

R. L. KLEINE,
Chairman, Committee on Coupler and Draft Equipment.

treatment and varying chemistry. All designs of couplers tested were divided in four groups, each group being subjected to the full list of tests. The four groups comprise the following:

A. Couplers of the regular commercial product.

B. Couplers with the best heat treatment and chemistry which coupler manufacturers could recommend in light of their present experience.

C. Couplers unannealed by the manufacturers with 0.35 per cent. carbon low-phosphorus steel, heat-treated by the Pennsylvania Railroad.

D. Couplers unannealed by the manufacturers and made of steel in accordance with their present foundry practice and chemistry, and heat-treated by the Pennsylvania Railroad.

All testing of couplers and separate knuckles has heretofore been made by measuring the ultimate distortion after the final blow as prescribed by the M. C. B. Specifications, but in the tests conducted by this committee, the distortions were measured after each drop or pull and tabulated by so much plus or minus from the original dimensions, the idea being to establish the point at which permanent set takes place and study design therefrom. Fig. 1 shows the location of points, etc.

The results of all the individual tests were plotted graphically as well as summaries of the important dimensions, illustrating permanent set at the various blows or increments of load in each test (jerk, strike, pulling, etc.) for all

types of couplers under each grade of material. The four grades of material in each coupler were also compared by summary plots for the various tests.

ANALYSIS OF RESULTS OF TESTS.

The following comparisons are based upon the "A" material or the present commercial material used in couplers, and are only of a general nature without going into detail.

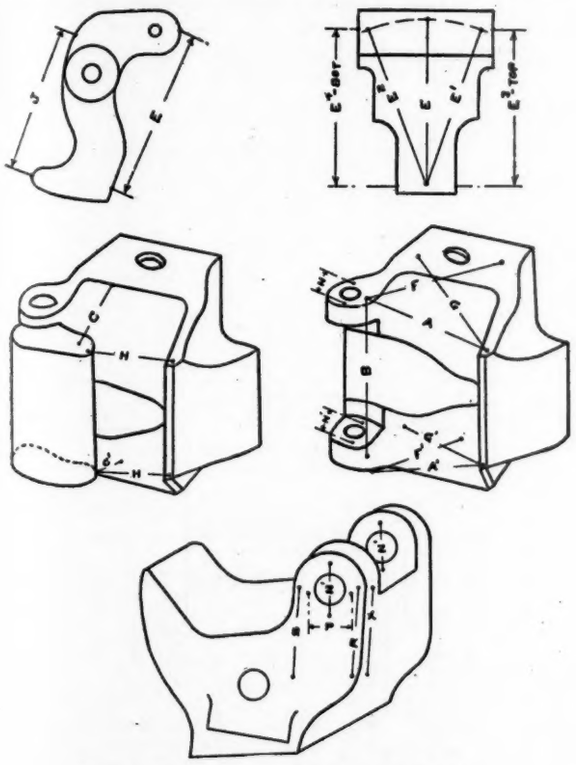


Fig. 1—Location of Points for Testing.

All couplers were given letter designations to represent the names of the couplers tested. Couplers Ta, Ua, Wa, Xa, Xb, Ya and Yc represent couplers of the latest types in general service; couplers Tb, Ub,Yb and Yd represent couplers of increased weight and strength in the development stage, a number of which are in service experimentally.

Pulling Test of Complete Couplers.—Standard M. C. B.

AVERAGE RESULTS OF PULLING TESTS.

COUPLERS—PRESENT.	Permanent Set at "C" (Knuckle Opening) at 150,000 pounds. Inches.	Load at 5/8 inch Set, M. C. B. Limit. Pounds.	Ultimate Load. Pounds.
Ta	.252	221,000	260,000
Ua	.282	255,000	320,000
Wa	.292	212,000	260,000
Xa	.302	198,000	249,000
Xb	.371	196,000	232,220
Ya	.283	200,000	280,000
Yc	.352	192,000	231,860
Average	.305	210,571	261,725
EXPERIMENTAL.			
Tb	.102	278,000	448,400
Ub	.098	300,000	300,000
Yb	.159	302,000	340,000
Yd	.112	304,000	404,563
Average	.118	296,000	373,241
Increase		40.6%	42.6%
Decrease	61.3%		

NOTE.—All couplers 5 by 7 inch shank except Ua, which was 5 by 5 inches.

test, 150,000 lbs. pull with limit knuckle opening of 5/8 in. ("C" dimension).

Static Guard-arm Tests (Pulling).—This test was developed on account of the present face test being unsatisfactory from the standpoint of not giving uniform results, mainly due to the variation between the minimum and maximum contour lines, allowing the block to seat higher or lower in the head, thus increasing or decreasing the wedging action. It consists of holding down the guard arm and shank and pulling on the coupler lugs.

Static Tensile Tests of Coupler Lugs.—This test was made to ascertain the strength of the coupler lugs in pulling, each lug being pulled separately on a standard diameter pin placed in the knuckle pivot pin hole.

Tensile Test of Material.—This was a regular tensile test

STATIC GUARD ARM TESTS.

COUPLERS—PRESENT.	Spread between Guard Arm and Lugs "A" at 120,000 Pounds. Inches.	ULTIMATE LOAD. Pounds.
Ta	.000	295,000
Ua	.185	216,000
Wa	.192	340,000
Xa	.011	320,000
Xb	.162	280,000
Ya	.176	310,000
Yc	.154	310,000
Average	.126	295,857
EXPERIMENTAL.		
Tb	.066	400,000
Ub	.187	260,000
Yb	*.063	*180,000
Yd	.085	340,000
Average	.113	333,333
Increase		12.7%
Decrease	10.3%	

* On account of Yb coupler being designed not to take any pull on lugs in service, same is not included in the average.

of the material in the couplers, using a piece sawed from shank of each coupler. Microscopic photographs (100 diameters) were taken of a section from both the shank and knuckle of each coupler.

Static Knuckle Tests, Pulling, Separate Knuckles.—This test was made to determine the elastic limit and ultimate strength of the separate knuckles. The knuckles were held in a forging by a standard diameter pin through pivot hole, the knuckle

TENSILE TESTS OF COUPLER LUGS.

COUPLERS—PRESENT.	TOP LUG.		BOTTOM LUG.	
	Maximum Load Without Permanent Set "N." Pounds.	Ultimate Load. Pounds.	Maximum Load Without Permanent Set "N." Pounds.	Ultimate Load. Pounds.
Ta	100,000	160,000	80,000	226,000
Ua	120,000	251,810	40,000	222,830
Wa	160,000	273,000	60,000	231,000
Xa	80,000	160,000	160,000	216,000
Xb	40,000	147,400	140,000	218,200
Ya			60,000	210,000
Yc	60,000	248,000	60,000	235,300
Average	93,333	206,701	85,714	220,190
EXPERIMENTAL.				
Tb	40,000	178,000	80,000	261,000
Ub	120,000	215,380	100,000	240,000
Yb	‡40,000	*84,980	‡40,000	*81,820
Yd	60,000	*80,000	60,000	*120,000
Average	73,000	196,690	80,000	250,500
Increase				13.7%
Decrease	21.4%	4.08%	6.7%	

* Small knuckle pin unable to stand higher loads. Not included in average.

‡ Since these lugs are very thin, the design of coupler not requiring them to take any load, they are not included in averages.

tail blocked on lock-bearing area and dummy engaging pulling face.

Dynamic Strike Tests, Complete Coupler.—Standard M. C. B. test, three blows of 1,640 pounds falling 5 feet, and three blows falling 10 feet.

Limit of knuckle closure "C" is 3/4 in. on bottom after third blow at 5 feet.

Limit of axial distortion is 1 7/8 in. on bottom after third blow at 10 feet.

Dynamic Guard-arm Tests, Coupler Body.—Formerly an M.

C. B. standard test now replaced by face test, three blows of 1,640 lbs. falling 3 feet, and four blows falling 5 feet.
Former limits after fourth blow at 5 feet:
Guard-arm deflection "A" is 7-16 in. on bottom.

TENSILE TESTS OF MATERIAL.

Couplers.	Elastic Limit, Pounds, per Square Inch.	Ultimate Strength, Pounds, per Square Inch.	Elastic Limit Divided by Ultimate Strength, Percent.	Elongation Percent in 2 Inches.		
				Actual.	Over Desired.	Under Desired.
Ta	36,690	50,520	72.6	10	.....	17.7
Ua	48,140	87,000	55.3	6	.....	10.
Wa	36,560	66,210	55.2	13	.....	8.1
Xa	20,890	61.620	33.9	6.5	.....	16.2
Xb	36,070	60,720	59.4	18	.....	5.1
Ya	35,120	64,400	54.5	22	0.3	.....
Yc	31,330	61,740	50.7	13	.....	9.7
Tb	35,550	66,100	53.8	20.5	.....	0.7
Ub	36,320	59,200	61.3	15.5	.....	8.1
Yb	33,130	61,300	54.0	14	.....	8.8
Yd	38,780	67,280	57.6	9	.....	11.8
Average	35,325	64,190	55.0	13.4	.....	8.4

NOTE.—Desired elongation in 2 inches equals 1,400,000 pounds divided by ultimate strength in pounds.

STATIC KNUCKLE TESTS.

Couplers—Present.	Greatest Load Before Set Took Place. (Average Top and Bottom) "E" Pounds.	Permanent Set at 150,000 Pounds Load. (Average Top and Bottom) "E" Inches.	Ultimate Load. Pounds.
Ta	120,000	.035	280,000
Ua	100,000	.075	253,860
Wa	80,000	.299	278,310
Xa	80,000	.261	260,000
Xb	80,000	.159	291,850
Ya	60,000	.365	*300,000
Yc	60,000	.278	233,570
Average	82,857.	.210	.....
EXPERIMENTAL.			
Tb	120,000	.038	*300,000
Ub	90,000	.077	239,830
Yb	220,000	.000	‡400,000
Yd	160,000	.000	†230,130
Average	147,500	.029	.....
Increase	78%	.....	.....
Decrease	.....	86.2%	.....

* Test discontinued account reaching capacity of machine.

‡ Pulling dummy failed.

† Test pivot pin failed, small diameter, account design of coupler.

DYNAMIC STRIKE TESTS.

Couplers—Present.	Total Blows Given at		Permanent Set "C" (Average Top and Bottom) After		Axial Distortion (Average Top and Bottom) After	
	5 Feet.	10 Feet.	Third Blow at 5 Feet. Inches.	Final Measurement. Inches.	Third Blow at 10 Feet. Inches.	Final Blow. Inches.
Ta	3	3	.468	.999	.812	.812
Ua	3	8	.109	1.812	1.062	1.530
Wa	3	6	.281	1.499	1.531	1.687
Xa	3	6	.025	.780	.906	1.343
Xb	3	2	.265	.499	.....	.562
Ya	3	4	.343	1.140	.781	1.234
Yc	3	5	.140	1.18	.781	1.343
Average	3	4.8	.233	1.135	.979	1.216
EXPERIMENTAL.						
Tb	3	9	.104	.767	.812	1.124
Ub	3	8	.116	.809	.781	1.281
Yb	3	10	.074	.783	.437	1.968
Yd	3	5	.116	.562	1.156	1.468
Average	3	8.0	.102	.730	.796	1.460
Increase	.....	66.6%	.....	.....	.....	20%
Decrease	.....	.....	56.2%	35.7%	18.7%	.....

Axial distortion is 1⅞ in. for 5 by 5 in. shank, 1½ in. for 5 by 7 in. shank, measured on bottom.

Dynamic Face Tests, Coupler Body.—Standard M. C. B. tests, three blows of 1,640 lbs. falling 5 feet, and two blows falling 10 feet.

DYNAMIC GUARD ARM TESTS.

Couplers—Present.	Total Blows Given at		Permanent Set "A" (Average Top and Bottom) After.		Axial Distortion (Average Top and Bottom) After.	
	3 Feet.	5 Feet.	Fourth Blow at 5 Feet. Inches.	Final Measurement. Inches.	Fourth Blow at 5 Feet. Inches.	Final Blow. Inches.
Ta	3	4	.452	.452	2.062	2.062
Ua	3	4	.265	.265	1.874	1.874
Wa	3	6	.406	.593	1.343	1.843
Xa	3	3	.....	.590	.....	1.014
Xb	3	2	.....	.488	.....	1.468
Ya	3	6	.437	.718	.874	1.343
Yc	3	12	.296	.828	1.281	2.281
Average	3	5.3	.371	.562	1.487	1.698
EXPERIMENTAL.						
Tb	3	19	.061	.342	1.281	Shank broken.
Ub	3	6	.197	.246	.875	Shank broken.
Yb	3	36	.028	.198	1.375	3.312
Yd	3	15	.140	.487	1.187	2.124
Average	3	19.0	.106	.318	1.179	2.718
Increase	.....	258%	.....	.....	.....	60%
Decrease	.....	.....	71.4%	43.4%	20.7%	.....

DYNAMIC FACE TESTS.

Couplers—Present.	Total Blows Given At		Permanent Set "A" (Average Top and Bottom) After		Axial Distortion (Average Top and Bottom) After	
	5 Feet.	10 Feet.	Second Blow at 10 Feet. Inches.	Final Measurement. Inches.	Second Blow at 10 Feet. Inches.	Final Blow. Inches.
Ta	3	4	.609	.828	.406	.531
Ua	3	2	.....	.562	.187	.187
Wa	3	1	.....	.484	.....	.156
Xa	3	2	.....	.476	.375	.375
Xb	1	0	.....	.....	Head Broken.	Head Broken.
Ya	3	5	.515	.718	.187	.250
Yc	3	3	.640	.718	.187	.250
Average	2.7	2.4	.588	.631	.268	.291
EXPERIMENTAL.						
Tb	3	6	.475	.630	.218	.468
Ub	3	4	.536	.759	.343	Head Broken.
Yb	3	7	.211	.351	.000	.468
Yd	3	3	.276	.276	.000	.125
Average	3	5	.374	.504	.140	.353
Increase	11.1%	108%	.....	.....	.....	21.3%
Decrease	.....	.....	36.4%	20.1%	47.7%	.....

DYNAMIC JERK TESTS.

Couplers—Present.	Total Blows Given at		Permanent Set "C" (Average Top and Bottom) After		Axial Distortion (Average Top and Bottom) After	
	5 Feet.	10 Feet.	Third Blow at 10 Feet. Inches.	Final Measurement. Inches.	Third Blow at 10 Feet. Inches.	Final Blow. Inches.
Ta	3	5	.374	.468	.156	.202
Ua	3	1	.....	.343	.....	.281
Wa	3	10	.328	.765	.202	.202
Xa	2	0	.....	.110	.....	.062
Xb	3	2	.....	.281	.....	.171
Ya	3	11	.327	.780	.093	.437
Yc	3	10	.406	.859	.156	.156
Average	2.8	5.5	.359	.515	.151	.216
EXPERIMENTAL.						
Tb	3	47	.123	.760	.062	.140
Ub	3	8	.324	.419	.000	.000
Yb	3	17	.485	.755	.124	.281
Yd	3	27	—.021	+.148	.093	.343
Average	3	24.7	.228	.520	.070	.191
Increase	7%	349%	.....	1%	.....	.....
Decrease	.....	.....	36.5%	.....	53.6%	11.6%

Limits after second blow at 10 feet:
Guard-arm deflection "A" is ¾ in. on bottom.

Axial distortion is 9/16 in. for 5 by 5 in. shank, 7/16 in. for 5 by 7 in. shank, measured on bottom.

Dynamic Jerk Tests, Complete Couplers.—Standard M. C. B. test, three blows of 1,640 lbs. falling 5 feet, and three blows falling 10 feet.

Limit after third blow at 10 feet: Knuckle opening at "C" is ¾ in., measured on bottom.

Dynamic Knuckle-strike Tests, Separate Knuckles.—Standard M. C. B. tests, three blows of 1,640 lbs. falling 4 feet, and three blows falling 8 feet.

Limit after third blow at 8 feet: No limit on deflection, but knuckle must not break.

Dynamic Knuckle-jerk Tests, Separate Knuckles.—Standard M. C. B. test, three blows of 1,640 lbs. falling 3 feet, and two blows falling 6 feet.

Limit after second blow at 6 feet: No limit on deflection, but knuckle must not break.

Dynamic Knuckle Strike Tests.

Couplers—Present.	Total Blows Given at		Permanent Set Compression "E" After		
	4 Feet.	8 Feet.	Third Blow at 4 Feet. Inches.	Third Blow at 8 Feet. Inches.	Final Measurement. Inches.
Ta	3	3	.107	.....	.325
Ua	3	4	.057	x	x
Wa	3	8	.088	.464	1.020
Xa	3	1	.070	.....	.070
Xb	3	2	.100	.....	.209
Ya	3	3	.110	.....	.435
Yc	3	21	.020	.400	2.540
Average	3	6	.079	.432	.766
Experimental.					
Tb	3	25	.000	.032	.211
Ub	3	8	.035	x	.150
Yb	Not Test	ed—Small	Pin Hole.		
Yd	Not Test	ed—Small	Pin Hole.		
Average	3	16.5	.017	.032	.180
Increase	0	175%	.....	.....	.....
Decrease	.....	.....	78.5%	92.6%	76.5%

x Unable to take measurements on account of pin bending.

"A," "B," "C" and "D" Materials.

As stated, the foregoing analysis of tests cover only the "A" material. The "B," "C" and "D" materials, comprising varying chemistry and special annealing or heat treatment, showed, in general, much higher tests, both static and dynamic, as compared with the "A" material or the commercial product of the manufacturers. The following comparison on the pull test will serve as an indication of the results of this special treatment, although the dynamic tests are not as uniform as the pulling tests. It is thought to design the standard coupler on the basis of the present commercial steel, reserving the advantages to be gained by heat treatment for future strengthening of the coupler or detail parts.

Dynamic Knuckle-Jerk Tests.

Couplers—Present.	Total Blows Given at		Permanent Set Elongation "E" After		
	3 Feet.	6 Feet.	Third Blow at 3 Feet. Inches.	Second Blow at 6 Feet. Inches.	Final Measurement. Inches.
Ta	3	8	.162	.437	.865
Ua	3	6	.143	.460	.875
Wa	3	5	.234	.608	1.010
Xa	3	7	.125	.417	.480
Xb	3	1	.330	.....	.330
Ya	3	6	.250	.700	1.260
Yc	3	5	.125	.566	.851
Average	3	5.4	.196	.531	.810
Experimental.					
Tb	3	17	.034	.213	1.105
Ub	3	1	.090	.....	.090
Yb	Not Test	ed—Small	Pin Hole.		
Yd	Not Test	ed—Small	Pin Hole.		
Average	3	9	.062	.213	.597
Increase	.....	66.6%	.....	.....	.....
Decrease	.....	.....	68.4%	59.9%	26.3%

"A" = annealed by manufacturers.

"B" = heat-treated by manufacturers.

"C" = approximate .35 per cent. carbon, heated to 1,600 deg. F., quenched in water, annealed at 1,100 deg. F.

"D" = approximate .25 per cent. carbon, heated to 1,600 deg. F., quenched in water, annealed at 900 deg. F.

Pulling Test of Complete Coupler.—Standard M. C. B. test, 150,000 lbs. pull with limit knuckle opening of 5/8 in. ("C" dimension).

Road Tests.

Road-service tests were conducted with couplers of present type on freight cars and with couplers of both present and the experimental design on freight locomotive tenders on the Pennsylvania. The freight car couplers were applied to 100,000 pounds capacity steel hopper cars in the coal trade between the bituminous mines in western Pennsylvania and tide water, a service comprising grade and flat country as well as hump-yard classification. The tender couplers were applied to 7,000-gallon steel tenders in general heavy freight service on the Western Pennsylvania Division, between Altoona and Pittsburgh, which includes heavy grade service.

Pulling Tests of Complete Couplers.

Couplers—Present.	Permanent Set at "C" (Knuckle Opening) at 150,000 Pounds. In Inches.				Ultimate Load in 1,000 Pounds.			
	"A"	"B"	"C"	"D"	"A"	"B"	"C"	"D"
Ta	.252	.076	.008	.093	260.0	322.6	290.0	389.8
Ua	.282	*.125	.070	.177	320.0*	321.9	226.0	428.4
Wa	.292	.369	.145	.222	260.0	272.2	270.0	280.0
Xa	.302	.225	.298	.262	248.0	260.0	270.0	336.0
Xb	.371	.428	.338	.346	232.2	230.0	276.0	292.0
Ya	.283	.246	.217	.267	280.0	310.0	320.5	346.0
Yc	.352	.166	.049	.079	231.8	270.0	290.0	335.2
Average	.305	.233	.161	.207	261.7	283.8	277.5	343.9
Experimental.								
Tb	.102	.074	.091	.050	448.4	461.5	438.5	480.0
Ub	.098	.077	.095	.101	300.0	388.8	432.0	440.0
Yb	.159	.129	.082	.051	340.0	341.0	421.0	390.0
Yd	.112	.126	.070	.122	404.5	420.0	479.8	436.0
Average	.118	.101	.084	.081	373.2	402.8	442.8	436.5
Increase	.....	.....	.....	.....	42.6%	41.9%	59.6%	26.9%
Decrease	61.3%	56.7%	47.8%	60.9%	.....	.....	.....	.....

These couplers were also laid off as shown in Exhibit 1, the bar and parts stenciled and plate labeled, and inspected and measured once every month to determine their operation and ability to withstand service, and thus draw comparisons between the static and dynamic tests with road-service tests.

The road tests of couplers on tenders in freight service develop in the shortest space of time the defects as well as the relative life of couplers; this is brought out very promi-

Summary of Road Tests of Car Couplers.

Couplers.	Bar No.	Date.	Days in Service	C	C¹	H	H¹	E³	E⁴
Ta	620	4- 1-13	246	+.18	+.11	+.04	+.07	+.06	+.05
Ta	621	4- 1-13	246	+.16	+.07	+.06	+.12	+.07	+.04
Ua	600	4- 1-13	246	+.15	+.20	+.11	+.18	+.08	+.05
Ua	601	4- 1-13	246	+.17	+.14	.....	+.11	—.01	.....
Wa	604	5- 6-13	281	+.16	+.24	+.20	+.24	+.01	+.07
Wa	605	5- 6-13	281	+.13	+.25	+.14	+.27	—.02	+.14
Xa	608	4-21-13	266	+.27	+.16	+.14	+.16	+.05	+.07
Xa	609	2-28-13	243	+.14	+.10	+.07	+.16	—.01	—.04
Ya	612	5- 6-13	281	+.22	+.19	+.14	+.16	+.07	+.08
Ya	613	5- 6-13	281	+.16	+.12	+.13	+.26	.....	+.01
Yc	616	4- 8-13	253	+.08	+.11	+.04	+.11	—.02	—.01
Yc	617	4- 8-13	253	+.15	+.14	+.06	+.12	—.02	+.03
Average, all bars			260	+.16	+.15	+.09	+.16	.....	.....
				+.155		+.125		.....	.....

Summary—*Freight Car Couplers.*—Summary of measurements, showing deflections at "C," "H" and "E" of the twelve couplers of present type in freight car service at last reading. All these couplers were in service at the last reading.

Conferences with Manufacturers.

While the committee was engaged in conducting the foregoing tests, as well as gathering data on the breakage of couplers in service, the gage of couplers, efficiency of knuckle

nently by referring to the logs of these tests.—[Not reproduced.—Editor.] It is surprising to note the short life of couplers of the present type in this service, as well as the relatively longer life that is being obtained from the experimental couplers.

throwers and lock-sets, slack in couplers, etc., the coupler manufacturers were experimenting along the lines of tentative specifications bearing on the important and fundamental principles involving the detail design of coupler and parts which the committee had previously decided should be incorporated, as far as practicable, in the standard coupler. These tentative specifications had been submitted to the coupler manufacturers for their consideration at the first joint meeting, held March 4, 1912, and were as follows:

Knuckle.—No strain on the knuckle pin. A minimum of 6 sq. in. knuckle-bearing area on the lock, to be central with the knuckle face. That the back thrust should be taken on the shoulders of the knuckle hub and on the back of the knuckle shank. That lost motion between the knuckle and lock (¼ to ⅜ in. now allowed by M. C. B. specifications) be eliminated if possible. That a smaller knuckle pin than the present standard be used as a pivot pin only, thus making it possible to increase the section through the knuckle hub and coupler lugs.

Lock.—Wedge type, to take up wear. One piece, if possible. Lock-bearing area on wall of coupler to be 6 sq. in. minimum. Top and bottom unlocking arrangement.

Knuckle Throw.—Bell crank type, which will throw the knuckle from any position and follow it out to the full open position.

Lock Set.—Preferably on some stationary part of the coupler head instead of on a movable part.

Coupler Head.—To be designed to conform to the above details.

Subsequent to the conference of March 4, 1912, joint meetings were held at Altoona, Pa., with the coupler manufacturers on April 26 and May 15, 1912, the results of which were recorded in the report to the last convention.

At a meeting of the Coupler Committee, held at Altoona, October 22, 1912, it was decided that sufficient data were at hand taken from couplers in service, as well as from the tests being conducted, to enable the committee to proceed with the coupler manufacturers in designing the proposed standard coupler.

The joint committee of representatives of coupler manufacturers and the committee accordingly held meetings to discuss and decide upon details and fundamentals of design, such as operation, contour lines, strength of the various parts, dimensions of knuckle hub and knuckle pin hole, location of knuckle pin hole and lock set, and type of knuckle thrower, etc. Much discussion ensued on these points which are pertinent to design, each one influencing the other to such an extent that full development of any one will handicap the other.

The harmonizing of ideas between the committee and the mechanical representatives of the coupler manufacturers, who have practically devoted their whole life to coupler design, and each previously working along different lines, was gradually accomplished in many of the details.

At a meeting on November 19, 1912, at the suggestion of Mr. Bush, the fundamentals to be used in the design of the coupler or couplers were discussed, taking the Coupler Committee's recommendations as a basis, and the following decided upon:

Knuckle:

1. The knuckle should be of uniform strength throughout and should provide for a pull of 200,000 lbs., not exceeding the elastic limit.
2. That the greatest dimension possible through hub is most efficient and desirable.
3. That the point of fulcrum should be as far forward as possible.
4. The center of pivot should not be far from the neutral axis at the hub and toward the back of knuckle.
5. The knuckle should be so designed in connection with other parts as to permit of relieving stresses on pivot pin under pull of 200,000 lbs., without permanent set.
6. Knuckle should be so designed that back thrust should be taken on shoulders of hub and back of shank of knuckle.
7. Bearing areas for locking, pulling and buffing should be sufficient to avoid distortion of the surface.
8. The center line of vertical dimension of knuckle tail at lock-bearing surface should coincide approximately with the center line of vertical dimensions of head and knuckle face.

Lock:

1. A. Wedge type, to take up wear.
   B. Straight lock.
2. One piece, if possible.
3. There shall be no portion of the lock or lock lifter which may be possible to kink in operation.
4. Lock to be adaptable for top or bottom uncoupling arrangement.
5. Lock must not be cored within the knuckle-bearing area in order that crushing will not take place.
6. Lock must be so designed as not to twist or roll under tension.
7. Lock which requires a reversal of motion in locking is undesirable.
8. Bearing areas for the knuckle and coupler wall should be sufficient to avoid distortion of the surfaces.
9. Lift of lock to be kept as small as possible.
10. Lock must be so designed as to avoid creeping from the locked position.

Lock-set:

1. Preferably on some stationary part of the head rather than on any movable part.
2. Lock-set must be so designed that the lock will not be dislodged by jarring, due to uncoupling or switching.
3. Lock-set should preferably be arranged so that the lock can be dislodged by hand.
4. Lock-set should be dislodged at about 60 per cent. of the total swing of nose of knuckle.

Knuckle Throw:

1. Bell crank type, which will throw the knuckle from any position and follow it out to the full open position.

Mr. Bush was of the opinion that if a much stronger coupler is designed, having a wedge lock and resultant closer fitting, and decreasing dimensions between nose of knuckle and guard arm, more clearance between the face of knuckle and the contour line of head should be allowed by taking a little off of nose of knuckle and putting it on the hub.

At a meeting on December 16 and 17, 1912, the question of determining beforehand the length of head of the standard coupler was brought up and it was decided that this should remain as hitherto, between 9¼ in. and 12¼ in., keeping as near the former as possible.

The question of height of coupler head and total lift was also brought up, and it was decided that this should be investigated on locomotives, passenger and freight cars, with a view of establishing a limit.

The subject of contour lines was taken up. The National Malleable Casting company went into the proposition very thoroughly and Mr. Krakau presented the subject in a very able manner, distributing to each member present a set of 38 blue-prints, each of which was discussed in detail.

The data on coupling and curving was obtained on a special machine built for this purpose by the National Malleable Casting company, whose representatives also brought to the meeting an extensive set of adjustable wooden templates to illustrate the contour lines. The coupling and curve tests were all made without having any side clearance in the carrier iron, in order that they would be strictly comparative. Among the advantages claimed for this straight-line contour are:

1. Ideal for buffing forces in having the coupler face and front face of knuckle parallel to each other and both perpendicular to the centre line of the coupler shank. Elimination of buffing forces of the nose of the knuckle against the coupler face of mating coupler, distributing it along the whole of the face of both couplers and eliminating the wedging condition of the knuckles bearing at the same time on both the guard arm and the face of the mating coupler, which causes the splitting of the coupler faces.
2. Greater diameter of knuckle hub, wherein lies the limitation of knuckle strength.
3. The total number of degrees in the following series of coupling tests was 77 for two straight-line contours, 68 for two M. C. B. contours, and 67 for the combination of an M. C. B. contour coupling with a straight-line contour.

a. Both knuckles open	When machine is angled toward knuckle side of moving coupler.
b. Moving knuckle open	
c. Stationary knuckle open	
d. Both knuckles open	When machine is angled toward guard arm side of moving coupler.
e. Moving knuckle open	
f. Stationary knuckle open	

4. The clearance between the coupler face of one and the front of the knuckle of mating one of two straight-line contours is about ⅞ in., which represents initial slack. This initial slack in a coupler having a wedge lock would not increase in service as the present M. C. B. couplers do, and most of it is required for vertical angling. This would eliminate the destructive strains set up by vertical angling in the M. C. B. contour lines in hump and tipple operations.

The proposed contour line will provide about ⅞ in. initial slack between two such contour couplers, whereas the slack between two M. C. B. standard contours of mean contour lines is $\frac{7}{32}$ in.

At a meeting on February 18, 1913, several members feared this increase in initial slack as being destructive to the coupler in starting trains, but the advocates of the pro-

posed contour explained that the initial slack in this proposed contour would not be materially increased by service when accompanied by a wedge type of lock in the coupler.

It was also claimed that most of this initial slack of 7/8 in. is required for vertical angling of couplers in going over summit of yard humps and coal wharfs, and that couplers of present M. C. B. contour lines are being greatly distorted and damaged in operations of this nature.

Most of the members favored the proposed contour lines, providing this initial slack would not prove detrimental; therefore, to accurately ascertain the slack per coupling in couplers in present service the following test was decided upon and carried out: A mixed train of 61 empty cars and an engine was taken in "WJ" west-bound empty receiving yard, Altoona, Pa., and cars separated a distance of about 6 feet, the following data being taken for each end of the car:

Car.—Initials, number and type.

Coupler.—Name, age—old or new, and size of shank.

With the coupler locked the dimensions "C" and "H" were taken both with the knuckle pulled out by hand against lock, and pushed back by hand, also the distance from guard arm to nose of knuckle with knuckle in full open position. The

TESTS OF SLACK IN COUPLERS.

		Minimum. Inches.	Maximum. Inches.	Average. Inches.
1. "C"—Knuckle pulled out against lock by hand	P. R. R.	3 7/32	4 5/8	3.73
	N. Y. C.	3 1/8	4 3/8	3.55
	M. C. B. Std.	3 9/32	3 11/32	3.344
2. "C"—Knuckle pushed back by hand	P. R. R.	2 5/8	3 7/16	3.03
	N. Y. C.	2 1/8	3 3/4	3.02
3. "H"—Knuckle pulled out against lock by hand	P. R. R.	4 11/32	5 17/32	4.93
	N. Y. C.	4 1/2	5 9/16	4.84
	M. C. B. Std.	4 11/32	4 13/32	4.625
4. "H"—Knuckle pushed back by hand	P. R. R.	3 31/32	4 5/8	4.24
5. Full opening of knuckle—Guard arm to nose of knuckle	P. R. R.	8 5/16	10 13/16	9 1/4
6. Average play of knuckles, measured on "C"—Item 1 minus Item 2	P. R. R.	.....	0.70	.....
	N. Y. C.	.....	0.53	.....
7. Average slack per coupling, Train stretched with locomotive	P. R. R.	.....	1.66	*
	N. Y. C.	.....	1.22	
	C.M.& St.P.	.....	.637	

8. Total slack in couplers—P. R. R. Train—61 couplings, 8 feet, 5 7/16 inches.

9. Total slack in train—P. R. R. Train—61 couplings — including couplers and draft gears, 49 feet, 4 3/4 inches.

10. *Character of equipment measured on.
- P. R. R.—61 old cars and locomotive.
- N. Y. C.—109 cars, new and old.
- C. M. & St. P.—26 new cars.

P. R. R. Train—61 Cars and Locomotives.	N. Y. C. & H. R. R. R. Trains.
32 steel and steel underframe cars. 29 wooden cars. 123 couplers measured—117 old, 6 new.	136 couplers measured on old cars—Average slack per coupling 1.39 in. 82 couplers measured on new cars—Average slack per coupling .96 in. These new cars were built since March 1912, 21 of which couplers were on cars built in December, 1912.

SUMMARY (EXCLUSIVE OF NEW CARS).

Test On.	Number of Couplings.	Average Slack. Inches.	Maximum Slack Found. Inches.	Average Gauge. Inches.
P. R. R.	61	1.66	+2 1/8	4.93
N. Y. C. & H. R.	68	1.39	*2 1/4	4.88

+ Gauge of couplers in this coupling, 5 3/32 inches and 5 1/32 inches.

* Gauge of couplers in this coupling, 5 inches and 5 3/16 inches.

cars were then coupled and bunched, setting brakes on several cars on both ends to insure the bunching, and each coupler was centrally punched on top of head just back of face and on longitudinal centre line of coupler; that is, one coupler of each coupling was centre-punched on its centre line and with a pair of dividers set at 6½ in., and with the centre-punch-hole on one coupler as a centre, an arc was described on the other coupler and then centre-punched thereon at that coupler's centre line, thus getting a uniform distance of 6½ in. between these two points. The train was then stretched by a locomotive and brakes set on several cars on both ends to insure the stretching, then the distance between the centre-punched marks of each coupling above referred to was trammed and the difference between this distance and the original 6½ in. as laid off with cars bunched is the slack per coupling.

The accompanying table shows the information obtained, as well as similar data taken by the N. Y. C. & H. R. R. R. and the C. M. & St. P. Ry.:

These tests showed that slack per coupling in couplers in service greatly exceeds the slack per coupling as given in the proposed straight-line contour.

Vertical Angling.—Vertical angling on humps and the slack available and its location in the contour lines was illustrated by T. J. Boring, who also showed that the most severe hump on the P. R. R. is one having a 4.46 per cent. grade on one side of apex and a 3.07 per cent. grade on other side (equalling a 7.53 per cent. grade adjacent to a level), which with 9-in. face knuckles would require 21-32 in. slack in contour lines neglecting the ever variable vertical curve at the apex which the overhang of the cars would often span. Considerable argument ensued concerning the amount of slack available in M. C. B. contour lines for vertical angling as to whether the slack proper in the lines should be counted once or twice. It was demonstrated and finally agreed that 7-32 in., the clearance in the mean M. C. B. lines, is all that is available for vertical angling, with the understanding that the couplers are in tension at the time when the top of the pulling face of both knuckles are in contact with each other, which would be at the vertex of any hump having same grade on both sides and couplers of the same height. When the latter conditions are not present the knuckles will assume the mentioned position a short distance either side of the summit of the hump. It was also demonstrated and agreed that the slack per coupling with couplers in bunched position available for starting trains is 7-32 in., which is clearance in the mean M. C. B. contour lines, plus an equal amount, 7-32 in., taken from back lash of couplers plus the very small amount which may be developed by the knuckles rotating on the coupling point after the second 7-32 in. just mentioned is taken up.

At this meeting a compromise was made in the location of the knuckle pivot pin hole and ½ in. back of coupling line was decided on for the present.

It was also decided that the height of the coupler head above the centre line of the shank be set at 8¼ in. tentatively and to be further investigated.

The subject of the depth of the knuckle hub brought forth considerable discussion, especially relative to using the eventual one-standard head and particularly the knuckle for both passenger and freight, which Mr. Brazier strongly contended for. With a knuckle hub depth of 10 in. the height above centre line of shank would be 5 in. of the knuckle hub depth plus 2 in. for coupler lug, totaling 7 in., allowing that knuckle pivot pin would be applied from below; this 7 in. would curve under the buffer plate of passenger cars and 3 in. should also be allowed there for clearance, to allow for variation in coupler height.. The making of an unsymmetrical head such as offsetting head below centre line of shank, etc., was mentioned, but finally it was decided to design the standard freight car coupler and later design a passenger head to take same knuckle if possible.

The depth of knuckle hub was set at 10 in., not counting pivot pin protector lugs, should any be used. To do this it will probably be necessary to reduce the 200.000 lbs. elastic limit previously decided upon as desirable. (This was subsequently reduced to 9 in.)

Depth of Coupler Shank:—It was decided that the Coupler Committee would thresh this out among themselves. In the meantime we will consider 6 by 8 in. shank for new cars and 5 by 7 in. shank for existing cars.

When Lock-set Is Dislodged:—The tripping of lock-set at 6¼ in. measured perpendicularly from guard arm to nearest point of knuckle nose was decided tentatively at the December, 1912, meeting. Adopted at 6¼ in.

Full Opening of Knuckle:—It was suggested that this be in line with coupler lug parallel to centre line of coupler, but was finally decided at 9 in., with ⅛ in. variation either way measured perpendicularly from guard arm to nearest point of knuckle nose. The question was brought up that the end of guard arm only takes half of the guard-arm movable point of the M. C. B. contour gage. It was stated that this was intentional, but no change was decided at this time.

Lift of Locking Pin:—It was decided that the maximum total lift, should be same as present M. C. B. maximum lift, 6 in., operated either top or bottom.

COUPLING TESTS, COMPARING PRESENT M. C. B. STANDARD AND PROPOSED STRAIGHT-LINE CONTOUR

Full-size steel couplers having the various contour lines were used, and the tests were made on a machine specially built for determining the greatest possible degree of horizontal angling between two couplers and for testing coupling operations between them when in line or at an angle.

The end of the machine supporting one coupler is sta-

tionary, and the other coupler is mounted on a carriage arranged to move longitudinally by means of compressed air on a short track, supported in a frame which is pivoted at the inner end, and capable of swinging laterally at the outer end, the pivot being in vertical alignment with the pulling

placed in alignment with both knuckles open and coupled three times; then the knuckle on the moving carriage was opened, the other closed, and three couplings made; then the knuckle on the moving carriage was closed and the other opened and three couplings made; then nine similar coup-

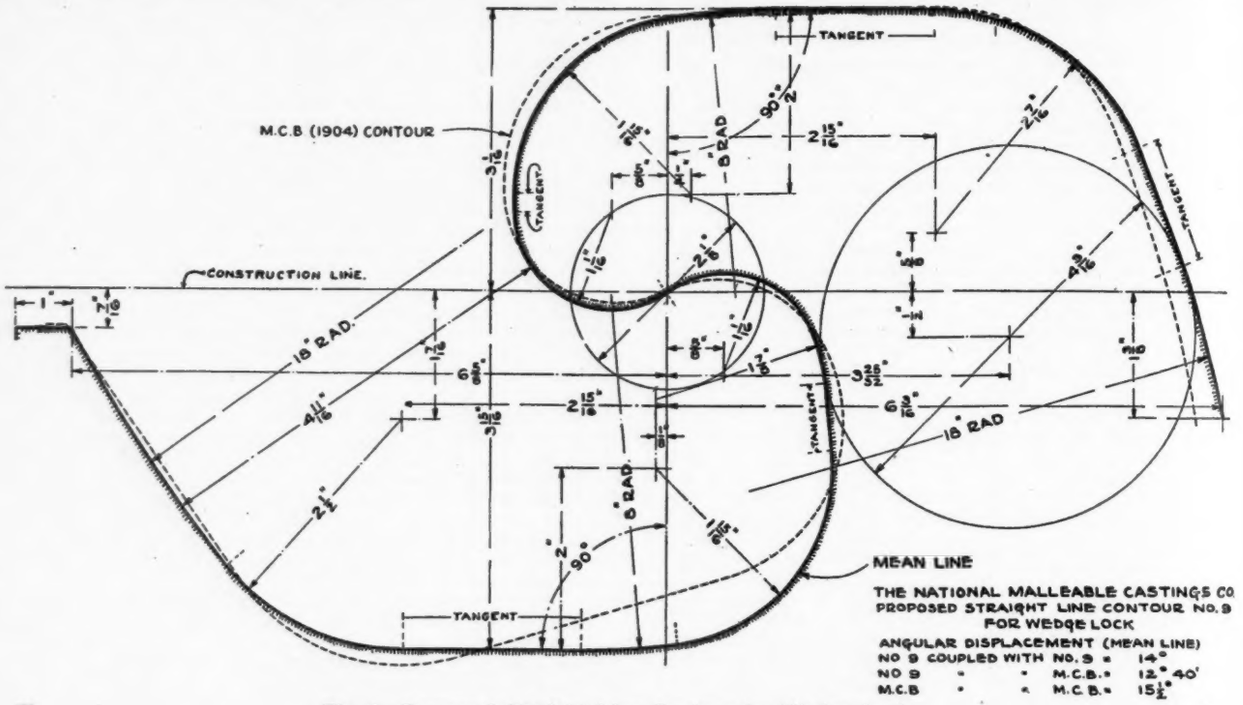

TANGENT
M.C.B (1904) CONTOUR
CONSTRUCTION LINE.
18" RAD.
8" RAD
MEAN LINE
THE NATIONAL MALLEABLE CASTINGS CO
PROPOSED STRAIGHT LINE CONTOUR NO. 9
FOR WEDGE LOCK
ANGULAR DISPLACEMENT (MEAN LINE)
NO 9 COUPLED WITH NO. 9 = 14°
NO 9 " " M.C.B. = 12° 40'
M.C.B " " M.C.B. = 15½°

Fig. 2—Proposed Straight Line Contour for Wedge Lock.

faces of the two knuckles when coupled. Thus the couplers can be angled relatively, and coupled and uncoupled in various positions. Each degree of angularity is shown by an indicator at the outer end of the swinging frame. The couplers are designated hereafter as being on the "moving car-

lings were made after swinging the moving carriage one degree to one side; the carriage was swung one degree further each time and similar couplings made at each degree, until a degree was reached at which couplings could no longer be made; then the moving carriage was swung one degree on

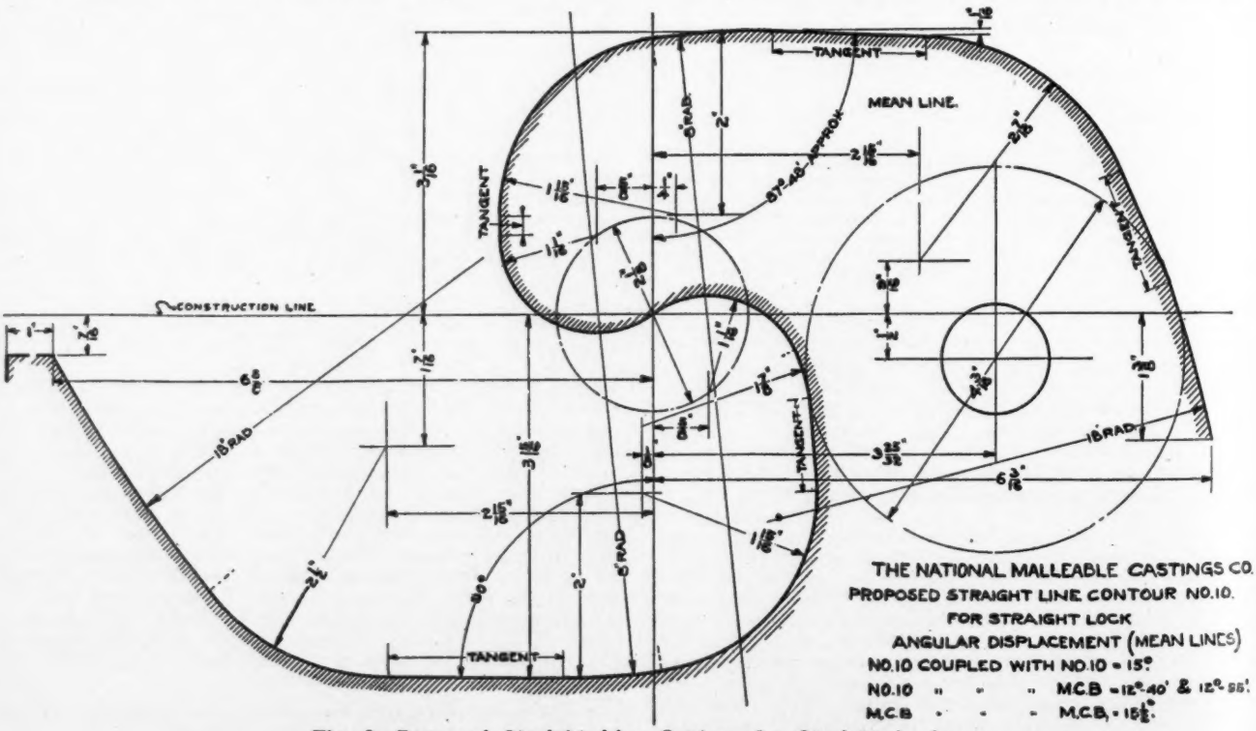


Fig. 3—Proposed Straight Line Contour for Straight Lock.

riage" or on the "stationary" end of the machine, as the case may be, and the sheets also indicate whether they were held rigidly in the carry irons, or were given the M. C. B. clearance of 1¼ in. on each side.

Each test was conducted as follows: Two couplers were

the other of the center and similar couplings made at each degree on that side.

This tset was made with two couplers having the M. C. B. contour operating together, with two having the proposed straight-line contour and also with two couplings, one hav-

ing one contour and the other the other contour, and in the case of two different contours, first with one contour on the moving carriage and then with the other thereon, so as to test all the different combinations in precisely the same manner and avoid any variations in results. After each test was made with the couplers held rigidly in the carry irons, so as to determine what could be accomplished with the lines alone, a similar test was made after giving the couplers the total side clearance of 2½ in. When side clearance was provided, couplings were considered to have failed if they could not be made without moving the couplers laterally in the carry irons by hand.

The speed of the moving carriage was regulated so that it was uniform throughout the test, and from two to three miles per hour.

Figs. 2 and 3 show the proposed straight-line contours, the former for a coupler with wedge lock, the latter for a coupler with straight lock. The difference between the two is entirely on the outer buffing face of the knuckle, and is due to the fact that the wedge lock holds the knuckle tightly when in locked position so that the knuckle tail cannot be pushed back away from the lock, and the outer face of the knuckle then has only one position, whereas the tail of the other knuckle has movement back of the straight lock when in locked position and when the knuckle is buffed back as far as possible its outer face, which should then be at right angles with the longitudinal axis of the coupler, is not in the same position as when the knuckle is pulled out against the lock, which latter position is the one gaged and the one which must be considered in a diagram of the line. Therefore, slightly different lines are necessary for the two kinds of coupler. In the exhibits illustrating contour lines the proposed lines as well as the present M. C. B. lines are the "mean" lines. All the couplers tested had the mean line.

There are several advantages in the proposed straight-line contour as compared with the present M. C. B. contour.

First: There is provision for greatly increased strength through the hub of knuckle, and also in the front face of coupler head.

Second: The outer face of knuckle has a continuous buffing bearing across face of coupler head at right angles to longitudinal axis of coupler, thus making the average length of lever arm from pivot to buffing face much shorter than that in the M. C. B. coupler, and by means of the continuous bearing and the short lever arm practically stopping the bending of the knuckle under buffing strains.

Third: By increasing the longitudinal clearance between two couplers when coupled together to ⅞ in. provision is made for the vertical angling between couplers when passing over humps, etc., without putting any strain upon the couplers; at present there is not nearly enough clearance for this purpose, and strains are put upon all the parts when the knuckles are stretched in passing over humps and dips. The proposed straight-line contour with ⅞ in. longitudinal clearance will permit couplers having a 9-in. depth knuckle face to angle 5 degrees 35 minutes, which will permit them to pass freely over a change in grade of 9.7 per cent.

Fourth: In buffing on curves, as well as on a straight track, there is never any wedging action due to knuckle engaging face of coupler head and face of guard arm of mating coupler. With the present M. C. B. line, couplers are distorted and broken on this account.

Fifth: The proposed straight-line contours gave a higher total number of degrees at which couplings could be made as compared with M. C. B. contour.

Some of the Disadvantages are:

First: Lesser maximum angle which straight-line contours will swing when coupled together.

Second: Last portion of knuckle closure is accomplished by momentum when coupling on curves, instead of by contact of knuckle with face of mating coupler, but on the larger radius curves the couplers will adjust themselves to straight-line conditions to the amount of side clearance for coupler shank.

Third: Amount of slack in starting trains.

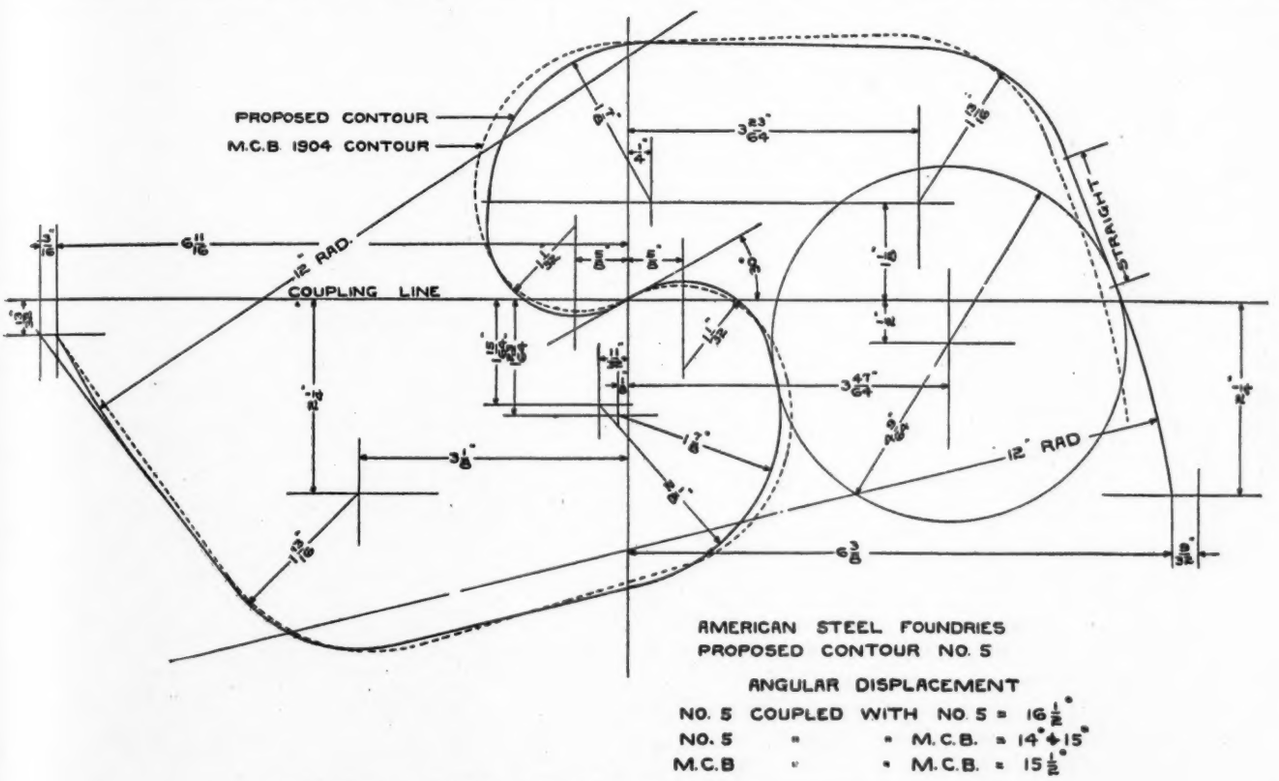


Fig. 4—Proposed Straight Line Contour; American Steel Foundries No. 5.

The proposed straight contour line was approved by all members of the M. C. B. Coupler committee and three of the coupler manufacturers, while two of the latter had not erplied and the American Steel Foundries criticised same and submitted their No. 6 contour as one which would give better results, it being a compromise of straight-line face and M. C. B. face with other modifications over present M. C. B. contour.

Since the contour lines are so vastly important and the earnest desire of all is to arrive at the best contour possible, the chairman decided to give the American Steel Foundries No. 6 contour a try-out, hence the meeting at Cleveland was called to try out and test the various contours and decide upon one as our unanimous recommendation to the M. C. B. Association. The American Steel Foundries agreed to ship to the National Malleable Castings Company at Cleveland two couplers having the No. 6 contour and two couplers having present M. C. B. contour, all with recommended location of knuckle pivot pin.

The first day of the meeting two couplers with proposed straight-line contours and two couplers with present M. C.

B. contours were tried out in the machine, mating with themselves and with each other; and during the second day of the meeting two couplers having the American Steel Foundries No. 6 contour were tried out with themselves and with couplers having present M. C. B. contour, both for angling and coupling.

The trials were very closely observed and all points previously brought out and those appearing during the trials were freely and very generally discussed. The American Steel Foundries No. 6 contour gave the greatest range of horizontal angling and coupling, but was not considered satisfactory when compared with the straight lines for taking care of the buffing shocks, and R. E. Janney, representative of the American Steel Foundries, withdrew his No. 6 contour in favor of his No. 5, (Fig. 4), which does not take metal off face of present M. C. B. contour, though it embodies the other modifications for increased strength across knuckle hub and increased angling. It was agreed and proven by tests that with any contour departing from present M. C. B. by taking metal off coupler face, when coupling with present M. C. B. on straight track and the M. C. B. knuckle open, there will not be contact between nose of M. C. B. knuckle and face of mating coupler throughout the act of coupling, but will require momentum during the last ¼ inch (depending upon design) of locking of M. C. B. knuckle (this does not apply when the knuckle of the straight-line contour is open and the M. C. B. knuckle closed); also that contours with incline of coupler face reduced over present M. C. B. mating with its kind, will require this momentum in closing when couplers are angled.

In summing up the trials, each representative present voiced his views, and it was decided that the proposed straight-line contour and a contour not reducing incline of coupler face but embodying enlargement in diameter of knuckle hub and other slight changes over present M. C. B. contour as represented by the American Steel Foundries No. 5 contour, should be given a large and thorough trial in service, with the feeling that if the proposed straight-line contour couplers gave no general trouble in coupling it should be adopted, otherwise we should hold to a contour having incline of coupler face not reduced over present M. C. B. contour and make the best of it in buffing, even though it was not designed for sustaining the enormous shocks imposed in buffing in service.

STRENGTH OF COUPLERS.

The general investigation of coupler conditions and the result of tests—static, dynamic and road—conducted by the committee, as well as the great number of couplers and parts requiring renewal, demonstrates beyond a doubt that the present coupler is inadequate in strength to meet the increased demands placed upon it, consequently considerably curtailing its life, which is aside from the desirability of reducing the number of designs to a minimum. The investigations and developments made during the past year have satisfied your committee that this required increase in strength can be accomplished, but the weight of the coupler will necessarily have to be increased from 30 to 40 per cent.

EXHIBIT OF COUPLERS.

Immediately back of Convention Hall, at the north side of the Pier, the committee has on exhibition various designs of couplers embodying the specifications jointly agreed upon between the coupler manufacturers and the committee, the manufacturers having designed the working parts according to their ideas to meet these specifications. It is now essential to select from these couplers several designs to be tried out in service during the coming year to definitely determine the best contour lines, efficiency of operation and strength of the various parts, with a view of harmonizing the designs and eliminating the details that prove unsatisfactory, to the end of establishing the standard coupler. The committee desires the members of the Association to make a critical examination of the couplers in this exhibit and give to the coupler committee the benefit of their criticisms and recommendations.

EXPERIMENTAL COUPLERS.

After the committee has selected the couplers to be placed in service to be tried out experimentally, and the service tests show that no serious defects exist, the members will be notified which couplers can be recommended for trial purposes, so that a general trial, in limited quantities, can be made by the railroads to ascertain their suitability for general service; this trial to be preferably conducted on locomotives. Until this announcement is made, the committee must earnestly request the railroad representatives not to apply any new or experimental types of couplers on freight cars which involve new designs unless the parts are interchangeable with present couplers in service, as by so doing it will forestall the work of the committee and, for various reasons, possibly prevent the Association from arriving at a successful issue of the one-standard coupler.

The report is signed by.—R. L. Kleine (P. R. R.), Chairman; G. W. Wildin (N. Y., N. H. & H.); F. W. Brazier (N. Y. C.); J. F. De Voy (C. M. & St. P.); F. H. Stark (Pitts. Coal Co.); H. L. Trimyer (S. A. L.), and B. Julien (U. P.).

After reading the report Mr. R. L. Kleine said: The tests of the couplers are not of those couplers shown in the exhibit; but they were the early stages in the development of which these couplers are the refinement. Now, if you will refer to the report I will indicate a few of the important dimensions used throughout these tests. The important dimensions are the C dimension, from the coupling face to the knuckle face of the coupler, and the H dimension, known as the gage dimension; and in the knuckle-stretch, the E dimension, which is from the nose of the knuckle to the lock of the knuckle.

Referring back you will find two curves, the present grouping and the earlier experimental. We had an average permanent set of .3 in.; and in the experimental set an average of .1, or a decrease of 61.3 per cent. In the ultimate average load of the present couplers, we have 261,000 lbs. and in the experimental couplers, 373,000 lbs. an increase of 42.6 per cent. The static guard-arm test, which is a new one, was developed because of the unsatisfactory state of the present face test from the standpoint of not giving uniform results, mainly due to variations between the minimum and maximum contour lines, allowing the block to seat higher or lower in the head, thus increasing or decreasing the wedging action. It consists of holding down the guard-arm and shank and pulling on the coupler lugs The average ultimate load is 295,000 lbs. for the present couplers and 333,000 lbs. for the experimental couplers.

DISCUSSION.

F. W. Brazier (N. Y. C.): Although a member of the coupler committee, I want to say that perhaps you do not realize the amount of work and the care and attention, as well as the expense that the Pennsylvania Railroad has gone to in connection with this report. I have not the least doubt that that company has spent over $30,000 and each one of the committee has had a substitute on the committee, and each of these persons have worked for a period of at least six months on the report. There are lers. Is it not time that we got down to a standard coupler? Mr. Kleine and Mr. Wallis of the Pennsylvania have been so energetic and earnest in this work that they are deserving of more than ordinary praise. Mr. Kleine has given his time and thought to it night and day. We must come down to one standard form of knuckle which will fit into any coupler.

J. F. DeVoy (C. M. & St. P.): While I do not care to discuss the report at all, as a member of the Coupler Committee, it appears to me that after the representatives of the railroads have gone through this report and seen the amount of work that has been done, they should at least give their moral support to one of the greatest works that has been done in this association. I do not want to claim any credit whatever; I do not know that I have ever seen a man who has so tenaciously stuck to a subject as the chairman of the Coupler Committee, Mr. Kleine. He has been ably assisted by Mr. Young and Mr. Wallis, who have given their thought and attention to the matter and furnished every appliance that could be given to facilitate the work of the committee. Nothing has been said in the report which is contrary to the interests of the manufacturers. There has been nothing suggested in any way that the manufacturers cannot live up to. I believe every member of this association should go home, and insofar as he is able, get the support of his company in the purchase of a coupler which will conform to the recommendations of this committee.

J. J. Hennessey (C. M. & St. P.): I move that the recommendation that no railroad shall purchase or put into service any of these experimental couplers until they have received the final recommendations from the coupler committee, be carried out.

C. A. Schroyer (C. &. N. W.): Does that mean experimental couplers which may be brought forward? Does it mean not to exclude the couplers we are now using, but to exclude experimental couplers that are not in line with what our committee is going to recommend?

R. L. Kline: The purpose of that suggestion is that we do not want at this time to place in service strengthened couplers which take other knuckles and other detailed parts, and thus increase the number of couplers we already have on the market; and furthermore, not to place any of these experimental couplers in service until the committee has had an opportunity to go over them and make an examination

and investigation of them, and say to the members which one they should try.

Mr. Hennessey's motion was put to vote and carried.

President Fuller: We will be glad to hear from any of the coupler manufacturers, if they will confine their remarks to the mechanical features of the couplers and not refer to the name of the manufacturers.

F. F. Gaines (C. of Ga.): I would like to ask the chairman of the committee one question regarding the new contours proposed. The report does not remark very largely on the fact that if you are going to couple with the present M. C. B. knuckle, and the present M. C. B. knuckle has to be opened, you must depend on the impetus given it to close. Some of the present M. C. B. knuckles are gravity knuckles and have a spring in them. There are a lot of them in the country. It looks now as if we would get into trouble on that point.

R. L. Kleine: The committee absolutely taboos springs in couplers. There are some passenger couplers with spring locks, and in that case it would be a decided detriment to use the straight lines with a spring-lock arrangement, but the committee does not recommend a spring-lock arrangement. These contour lines, of course, will be for the new couplers, and also for the couplers we are now using. However, if the new coupler is adopted, it will be the standard, and you will not have to apply that contour line to the passenger car coupler, as we believe the passenger car coupler can be developed from the freight car coupler and possibly use the same lock and knuckle.

F. F. Gaines: I had no reference to passenger car couplers, but to freight car couplers. There are many which I do not believe will couple unless you have an impact all the way home. I do not want to decry the coupler at all, but I want to call attention to the one fact, because if we have to go in to close the knuckle by hand, we will be in the wrong place.

R. L. Kleine: We do not contemplate any closing by hand. We believe the ordinary coming together of the two couplers, with the slowest speed at which you can move the two cars, will close the coupler by impact, and after we have experimented with the coupler further, if we find that it does not, we will not recommend it to the association. For that reason we ask for a tryout, rather than suggesting it for recommended practice; and it can be tried out, irrespective of the adoption of a standard coupler, as the same coupler can be made with the two contour lines, that is, a coupler with the contour lines suggested in the report, and also with the present contour lines.

C. A. Schroyer (C. & N. W.): I have gone through that thing for so many years that I feel a little fearful in undertaking to interfere with our present contour lines. The contour line as adopted and used today, was shaped in such a way as to obtain the closing of the knuckles without having any slack between the drawbacks or as little as foundry practice would permit. In this report they show that there is a large amount of slack existing in the cars in operation today. That is due to the bending of the guard-arm of the knuckle, the wearing of the wearing-faces of the knuckle, and the wearing face of the pin. In the new knuckle, it is proposed to do away with that slack; but it is proposed to give slack by other means. The tight drawbar was used as a result of tests made at Burlington, where it was found there was a destructive shock and breaking in two of a train, which was a very dangerous thing. I am afraid of this today under the conditions we propose to adopt in the new coupler, which are practically the conditions which exist in the old coupler. I want to caution the committee to go carefully in the matter of changing the contour lines in any perceptible degree; the question of changing the lines to the extent of changing the buffing places is very important. We took out wedge lugs twenty years ago because we could not keep them in position. Many methods were tried to prevent it, but none were successful, and while you may have an anti-creeping device on these, they are not so positive in their action as to prevent it.

Col. Ralph W. Pope: The whole subject has been so admirably presented by the chairman of the committee, that we manufacturers have nothing to add; but we stand in the position of your servants, doing what we can to help the good work on.

Mr. Janney: I do not think there is anything we can add to the report. There is a great deal to be discussed which is not included in the report, but it is not material. We are all working as hard as we can and probably when the next convention comes around, we will have one coupler to submit.

R. L. Kleine: Mr. President. I move the recommendations for the changes in standard be submitted to letter ballot.

The motion was seconded and carried.

CAR WHEELS.

The committee submitted last year a proposed specification governing dimensions and tolerances for solid wrought-steel wheels for freight and passenger service, which specifications have been since adopted as recommended practice. As explained in last year's report, these specifications did not include rules governing the process of manufacturing the chemical and physical properties of the material, or analysis and tests. The determination of these questions has constituted the major part of the committee's work this year.

The specification has been revised to include all additions and changes and copy of the complete specifications are attached. It will be noted that no specification is given for physical test of steel wheels as the committee has been unable to determine a proper physical test for solid wrought-steel wheels. A number of experimental tests have been made but sufficient data have not been obtained to decide upon this question. The committee expects to continue its investigations on this subject and report to the next convention.

SPECIFICATIONS.

Specification for solid wrought carbon steel wheels for freight and passenger car service.

MANUFACTURE.

1a. *Process.*—The steel shall be made by the open-hearth process.

1b. *Discard.*—A sufficient discard shall be made from the top of each ingot from which the blanks are made, to insure freedom from injurious piping and undue segregation.

CHEMICAL PROPERTIES AND TESTS.

2a. *Chemical Composition.*—The steel shall conform to the following requirements as to chemical composition.

	ACID.		BASIC.	
Carbon	0 60	—0.80	0.65	—0.85 per cent.
Manganese	0.55	—0.80	0.55	—0.80 per cent.
Silicon	0.15	—0.35	0.10	—0.30 per cent.
Phosphorus	not over	0.05	not over	0.05 per cent.
Sulphur	not over	0.05	not over	0.05 per cent.

2b. *Ladle Analyses.*—To determine whether the material conforms to the requirements specified in Section II, an analysis shall be made by the manufacturer from a test ingot taken during the pouring of each melt. A copy of this analysis shall be given to the purchaser or his representative.

2c. *Check Analyses.*—A check analysis may be made by the purchaser from any one or more wheels representing each melt and this analysis shall conform to the requirements specified in Section II. A sample may be taken from any one point in the plate; or two samples may be taken, in which case they shall be on radii at right angles to each other. Samples shall not be taken in such a way as to impair the usefulness of the wheel. Drillings for analysis shall be taken by boring entirely through the sample parallel to the axis of the wheel; they shall be clean from scale, oil, and other foreign substances. All drillings from any one wheel shall be thoroughly mixed together.

2d. *Limits of Segregation.*—The segregation of either element of carbon, manganese, and phosphorous must not exceed 6 per cent. of the ladle test of the same melt or any part forming the thickness of the plate and tread and rim of the wheel.

TOLERANCES.

3. Wheels should be furnished rough bored and with faced hubs and have a contour of tread and flange as rolled or machined according to recommended practice Sheet M. C. B. *C.* They should conform to dimensions specified within the following tolerances:

3a. *Height of Flange.*—The height of flanges should not be more than ⅛ in. over and must not be under that specified or 1 in.

3b. *Thickness of Flange.*—Thickness of flange shall not vary more than $\frac{1}{16}$ in. over or under that specified.

3c. *Throat Radius.*—The radius of the throat shall not vary more than $\frac{1}{16}$ in. over or under that specified.

3d. *Thickness of Rim.*—The thickness of rim to be measured between the limit of wear groove and the top of the tread at the point where it joins the fillet at throat of flange. The average thickness of service metal of all wheels in any shipment must not be less than 1¾ in. measured from the limit of wear groove to top tread. The thickness of rim should in no case be less than $\frac{3}{16}$ in. under that specified.

3e. *Width of Rim.*—The width of rim shall not be more than ⅛ in. less nor more than ⅛ in. over that specified.

3f. *Thickness of Plate.*—The thickness of the plate of the wheel shall not be less than ¾ in. at the point where the plate joins the fillet at the rim and not less than one in. at the point where the plate joins the fillet at the hub. Intermediate minimum thickness to be proportional.

3g. *Limit of Wear Groove.*—The limit of wear groove to

be located as shown in Sheet M. C. B. C. recommended practice.

3h. *Diameter of Bore.*—The diameter of rough bore shall not vary more than 1/16 in. above or below that specified. When not specified the rough bore shall be 1/4 in. less in diameter than the finished bore subject to the above limitations.

3i. *Hub Diameter.*—The hub diameter may be either 10 in. or 11 in. in diameter as specified with a maximum variation of 1/8 in. below. The thickness of the wall of the finished bored hub shall not vary more than 3/8 in. at any two points on the same wheel.

3j. *Hub Length.*—The length of hub shall not vary more than 1/8 in. over or under that specified.

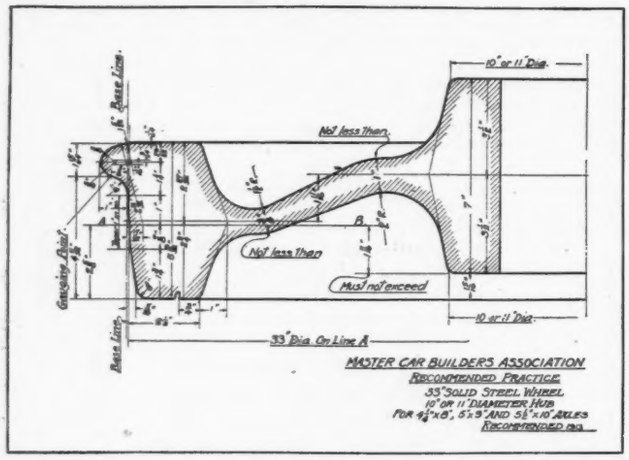


Fig. 1.—Recommended Practice for 33 in. Solid Steel Wheels For 5 1-2 in. x 10 in. Axles and Under.

(The 36 in. and 38 in. wheels have the same dimensions except for the diameter.)

3k. *Depression of Hub.*—The depression of the hub must be made so that the distance from the outside face of the hub to the line *AB* shall not exceed 1 11/16 in. for wheels used on 5½-in. axles and under and 1 7/16 in. for wheels used on 6 in. by 11 in. axles.

3l. *Black Spots in Hub.*—Black spots will be allowed within 2 in. of the face of the hub, but must not be of such depth

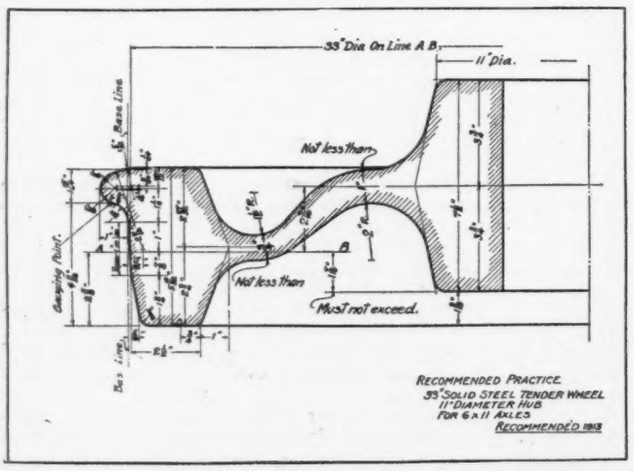


Fig. 2.—Recommended Practice for 33 in. Solid Steel Wheels for 6 in. x 11 in. Axles.

(The 36 in. and 38 in. wheels have the same dimensions except for the diameter.)

that they will not bore out and give clear metal at finished size of bore.

3m. *Eccentricity of Bore.*—The eccentricity between the tread at its center line and the rough bore shall not exceed 3/64 in.

3n. *Block Marks on Tread.*—The maximum height of block marks must not be greater than 1/64 in.

3o. *Rotundity.*—All wheels shall be gaged with a ring gage and the opening between the gage and tread at any one point shall not exceed 1/16 in.

3p. *Plane.*—Wheel shall be gaged with a ring gage placed concentric and perpendicular to the axis of the wheel. All points on the back of the rim equidistant from the center shall be within a variation of 1/16 in. from the plane, of the same gage when so placed.

3q. *Tape Sizes.*—Wheels shall not vary more than five tapes under nor nine tapes over the size called for.

3r. *Mating.*—The tape sizes shall be marked in plain figures on each wheel. Wheels must be mated to tape sizes and shipped in pairs.

3s. *Gage.*—Gages and tape used shall be M. C. B. Standard or Recommended Practice as follows: Wheel circumference measure, M. C. B. Standard, Sheet 16-A Maximum flange thickness gage, M. C. B. Standard, Sheet 16. Minimum flange thickness gage, M. C. B. Standard, Sheet 16. Rotundity gage, M. C. B. Recommended Practice, Sheet C. Plane Gage, M. C. B. Recommended Practice, Sheet C. Gage for measuring service metal, M. C. B. Recommended Practice, Sheet C-1.

BRANDING.

The name or brand of the manufacturer, date, and serial number shall be legibly stamped on each wheel in such a way

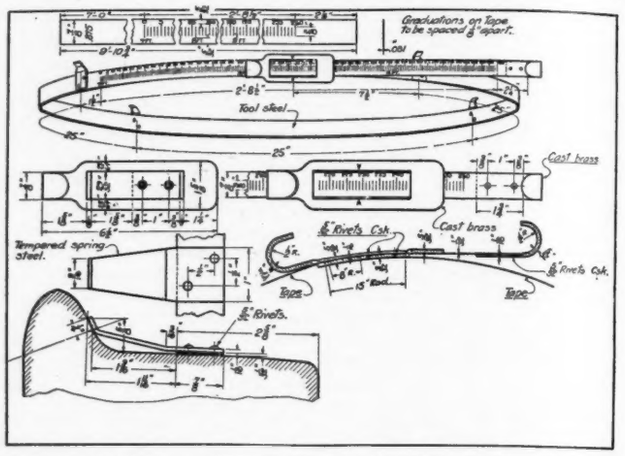


Fig. 3.—Circumference Gage for Steel and Steel Tired Wheels.

that the wheel may be readily identified. The tape size shall be legibly marked on each wheel. Sheet M. C. B. C-2.

FINISH.

5. The wheel shall be free from injurious defects, and shall have a workmanlike finish.

5a. Wheels shall not be offered for inspection if covered with paint, rust, or any other substance to such an extent as to hide defects.

INSPECTION.

6. Inspector representing the purchaser shall have free entry at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturers' work which concern the manufacturer of the material ordered.

6a. The manufacturer shall afford the inspector, free of cost, all reasonable facilities and necessary gages to satisfy him that the wheels are being furnished in accordance with these

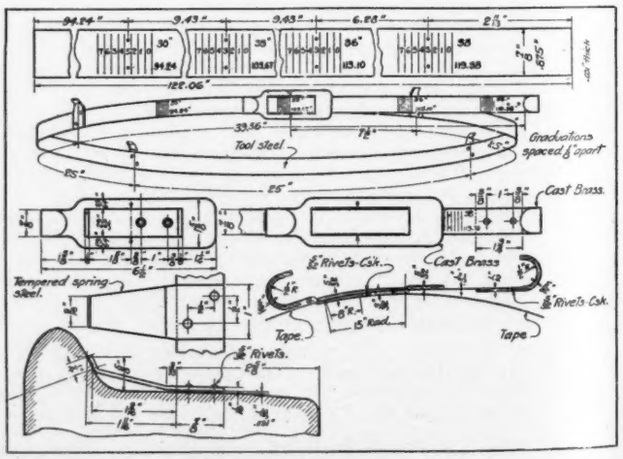


Fig. 4.—Circumference Gage for Cast Iron Wheels.

specifications. Tests and inspection at the place of manufacture shall be made prior to shipment, and free of cost to the purchaser.

6b. The purchaser may make the tests to govern the acceptance or rejection of material in his own laboratory or else-

where as may be decided by the purchaser. Such tests, however, shall be made at the expense of the purchaser.

6c. All tests and inspection shall be so conducted as not to interfere unnecessarily with the operation of the works.

6d. Wheels showing injurious defects while being finished by the purchaser shall be rejected, and manufacturer properly notified.

6e. Samples of rejected material must be preserved at the laboratory of the purchaser for one month from date of test report. In case of dissatisfaction with the results of the test, manufacturer may make claim for a re-hearing in that time.

On account of dimension of plates being added to the designs of steel wheels shown in 1912 report, it is recommended that new cuts be made to show the following wheels:—33 in.; 36 in., and 38 in. solid steel wheels for 5½ in. by 10 in. axles and under. (See Fig. 1). Thirty-three in., 36 in., and 38 in. solid steel wheels for 6 in. by 11 in. axles. (See Fig. 2).

The present M. C. B. circumference measure for cast-iron wheels has been found unsatisfactory for using with steel or steel-tired wheels, and a new circumference measure as used by most railroads and manufacturers, for taping steel wheels is recommended, as shown in Fig. 3.

It is also recommended that the present standard wheel circumference measure for cast-iron wheels, which has been found unsatisfactory, be discarded and a new design adopted, as shown in Fig. 4.

In last year's report the committee mentioned the question of establishing a maximum gross load for each design of wheel. This had particular reference to failures of cast-iron wheels used on heavy tare weight, such as refrigerator cars. The committee has given this matter further consideration and recommends that the titles of the chilled cast-iron wheels shown on M. C. B. Sheets N, O, and P, be changed as follows:

M. C. B. Sheet N, title to be changed from "M. C. B. Recommended Practice for Cast-iron Wheels for 60,000-pound Cars" to "M. C. B. Association Recommended Practice for 33-inch Cast-iron Wheels for Cars of Maximum Gross Weight, Not to Exceed 112,000 Pounds."

M. C. B. Sheet O, title to be changed from "M. C. B. Recommended Practice for Cast-iron Wheels for 80,000-pound Cars" to "M. C. B. Recommended Practice for 33-inch Cast-iron Wheels for Cars of Maximum Gross Weight, Not to Exceed 132,000 Pounds."

M. C. B. Sheet P, title to be changed from "M. C. B. Recommended Practice for Cast-iron Wheels for 100,000-pound Cars" to "M. C. B. Recommended Practice for 33-inch Cast-iron Wheels for Cars of Maximum Gross weight, Not to Exceed 161,000 Pounds."

The chairman of the committee has received a letter from G. W. Lyndon, secretary of the Association of Chilled Car Wheel Manufacturers, dated January 31, in regard to the question of guarantees of cast-iron wheels. A copy of letter is attached as an appendix to this report.

The report is signed by:—Wm. Garstang (C. C. C. & St. L.), chairman; W. C. A. Henry (Penna.); A. E. Manchester (C. M. & St. P.); R. W. Burnett (C. P.); R. L. Ettenger (So. Ry.); J. A. Pilcher (N. & W.), and O. C. Cromwell (B. & O.).

APPENDIX.

January 31, 1913.

William Garstang, Chairman, Master Car Builders' Standing Committee on Car Wheels, Indianapolis, Indiana.

DEAR SIR,—Our association has been endeavoring to uniformize the guarantee on car wheels with particular reference to the relative guarantee to be carried for wheels serving under cars of 30, 40 and 50-ton capacities. The increases in the loads carried by cars which have been put in service in the last twenty years present new conditions of guarantee, and the relative guarantees have never been figured on a scientific basis.

The six-year guarantee under 30-ton cars for 625-lb. wheels has been found satisfactory to maker and user, and this is because the wheel carries relatively a small load per pound of its own weight. When the cars are increased from 30 to 50-tons capacity, or 66⅔ per cent., the conditions of service are 625 to 725 lbs., or 16 per cent., the conditions of service are materially changed, because the tread or running surface of the three classes of wheels, which are your standards, are identically the same, and we contend that it is manifestly unfair to exact the same guarantee for each wheel, particularly by reason of the fact that the cars run relatively the same distance per year, but the tonnage carried by a 50-ton car exceeds that of a 30-ton car by 66⅔ per cent.

One or two railroads have insisted that the wheels under the three classes of cars should carry the same guarantee of six years.

I am attaching you herewith, a statement which will show that a guarantee of 6 years for 30-ton cars, 5 years for 40-ton cars and 4 years for 50-ton cars is a reasonable adjustment of the guarantee question on all classes of wheels. It really figures out 4½ years for 40-ton cars and 3½ years for 50-ton cars.

All we are trying to arrive at is a uniform basis by which we can present this matter to the railroads and arrive at a mutual understanding, and what we are striving for is a fair and reasonable basis of guarantee for the chilled iron car wheel.

I would be very much obliged if you would give me your answer at your earliest convenience.

Weight of car.	Weight of load.	Total weight	Average mileage per year.	Ton Miles.
30-ton car ..15 tons	30 tons	45 tons	8000	360,000
40-ton car ..20 tons	40 tons	60 tons	8000	480,000
50-ton car ..25 tons	50 tons	75 tons	8000	600,000

30-ton car, 360,000 ton miles, 6 years — 2,160,000 ton miles guarantee.
40-ton car, 480,000 ton miles, 4½ years — 2,160,000 ton miles guarantee.
50-ton car, 600,000 ton miles, 3½ years — 2,160,000 ton miles guarantee.

We ask for guarantee:
6 years — 625-pound wheel.
5 years — 675-pound wheel,
4 years — 725-pound wheel.

Yours truly,
Association of Manufacturers of Chilled Car Wheels,
By G. W. Lyndon, Special Secretary.

William Garstang (C. C. C. & St. L.) after reading the report said: I would like to mention that Mr. Dudley, consulting engineer on rails and wheels and structural materials for the New York Central Lines, in his research for defects in rails, has come to the conclusion that our present contour of the wheel is not a correct one; that the one and twenty contour throws the greater part of the load on the inside of the rail, and on account of this, that the rails are wearing much more rapidly than he thinks they would if we went back to our old contour of one in thirty-eight. In view of the fact that this matter has been brought before the wheel committee, I wish the association would consider that feature while considering the balance of the report.

DISCUSSION.

J. R. Onderdonk (B. & O.): Regarding "Limits of Segregation," the report states that the segregation of either element of carbon, manganese, and phosphorus must not exceed 6 per cent. of the ladle test. I would like to see steel as good as that made by the manufacturers, but I am afraid if we had a 6 per cent. variation, it would be difficult to live up to it. Take the element of phosphorus ,and you have .043; six per cent. would be .0026, with a variation of only 3 per cent. in phosphorus, the probability is that the chemist would not come any closer than that. I would also like to ask, in selecting the elements of carbon manganese and phosphorus, why the element of sulphur was left out?

C. A. Brandt (C. C. C. & St. L.): The sulphur should have been included in connection with phosphorus. In regard to the .06, it was considered that a limit of segregation of .06 per cent. would be a good thing. It is included in some of the railroads' specifications to-day, although the manufacturers will probably claim that they cannot make a good rail as low as that, but it is a thing we desire to get at.

C. D. Young (Penna.): I question the advisability of putting in a limit on segregation at the present time in our rolled steel wheel specifications. There are two reasons; in the first place, I am quite confident that the limit of .06 per cent. is too close for sulphur and phosphorus, with the present methods of determining commercially, phosphorus and sulphur in the laboratory. Sometimes the error in chemistry would be almost .06 per cent., and that would stand then as a rejection on a lot of wheels. There is another reason from the inspection standpoint, which makes it difficult. At the present time we are accepting our wheels on a .05 phosphorus and sulphur rejection, and we simply say that if the sulphur and phosphorus comes within that rejection limit, the wheels are acceptable and we do not carry the analyses any further. If it is within the limits, the material is accepted. We have been getting very satisfactory use from our wheels. A clause of this kind will require the railroads to have their chemistry carried on accurately in order to find whether the melt as determined by the manufacturer agrees with the railroad company's chemistry.

The practice in most of the mills, in getting chemical analyses, is to take the shortest methods possible, and I believe there will be a good deal of confusion in the checking of the heat analysis with the analysis from the borings of the wheels. I would like to make a motion that recommendation No. 1 be submitted to the association for letter ballot as recommended practice, as printed, leaving out these limits for segregation. I believe we should have some data from people who have had this entire specification in use, showing that they have gotten better service from it than those who have not had it in their specification, before we make it an M. C. B. requirement.

William Garstang: In order that we might vote on the report as a whole, would it not be well for someone who has had considerable experience in this matter to suggest

what would be a reasonable limit to be used in place of .06 per cent?

J. R. Onderdonk: I do not think that is a good way to get the segregation. The segregation which gives trouble in the wheel is the variation in the wheel itself, and not a variation of one part of the wheel with another, within small limits. If we put a limit of 10 per cent. on it I do not believe that we would arrive at what we are trying to accomplish. If we want to ascertain the segregation, the better way, I should judge, would be to make an analysis of two different parts of the same wheel, and then put in a limit of possibly 10 per cent. I think we shall have to go as high as that.

C. A. Brandt: According to the specifications, the limits of carbon are .06 to .08 per cent.; and of course the ideal method is to limit the variation of carbon to .06 to .08 in the same wheel. I think possibly a good many wheels are manufactured where the carbon might vary to that extent and yet the wheel be desirable; .06 per cent. is pretty close to what is desirable, and one of the important railroads in this country has that clause in its specifications now.

George L. Fowler: I think the suggestion to make the point of segregation two points in three might be very well, if you could pick out those two points, because in a wheel that was made from a slab that was rolled lengthwise of the ingot the line of segregation would be quite different from the segregation of a wheel that was made from a slab cut across the ingot; so I do not see how it would be possible to put in any kind of a specification a rule for picking out the place where the analysis should be made in order to determine the average segregation.

D. F. Crawford (Penna.): In seconding Mr. Young's motion, I had in mind the practical application of this particular point. I happened to know of some rails that gave rather excellent service, and they were examined chemically and very carefully, and it was found that they were quite badly segregated. I do not feel at this time we should put in a limit of segregation until we find out what effect it will have on the service results of the wheels.

President Fuller: The motion before the house is that recommendation No. 1 be approved and submitted to letter ballot, eliminating the limit of segregation.

The motion was put to vote and carried.

E. W. Pratt (C. & N. W.): I move that the balance of the recommendations be approved and submitted to letter ballot.

The motion was seconded and carried.

William Garstang: Before we close on the wheel question, there is a point in connection with the chilled cast-iron wheels which is not touched on in the committee's report, and that is a thickness of the flange of greater dimensions than that described to this association. The wheel manufacturers have asked repeatedly to be allowed to increase the thickness of the flange ⅛ in., an increase of ⅛ in. of metal back of the flange and below the tread line, or between the tread line and the centre of the wheel; but the committee has not considerd this request seriously, from the fact that such an increase would interfere with the road conditions in regard to clearances, frogs, switches and crossings.

There are samples of the thick-flanged wheel to which I refer, on exhibition on the pier, and as nearly as I can learn there are several thousand of these wheels in service today. I have been written to on two or three occasions asking what we would recommend be done with such wheels when they are offered in interchange? Personally I think the wheel can be run with safety; in fact, I know it is run with safety. We feel that with the additional ⅛ in. added to the flanges of these wheels we would have a cast-iron wheel of sufficient strength to use under the heaviest cars contemplated at the present time, and in view of the fact that there are a large number of these wheels in service, I would suggest that the question of opening up the clearances in frogs and crossings and guard-rails be taken up by this association, either through its executive committee or a committee appointed especially for that purpose, with the American Railway Association, with a view of having that association appoint a committee to work with this association, to see whether or not we can get the clearances increased.

I believe that with ⅛ in. more clearance in our frogs and switches, the manufacturers of chilled cast-iron wheels can produce a wheel that is perfectly safe and one which will yield more economical service than any wheel we have on the market; and I would recommend that the matter be taken up by this association with the American Railway Association with regard to getting increased clearances in the frogs and crossings. I mean that as a motion.

The motion was seconded and carried.

President Fuller: Mr. Garstang, you spoke of one other subject, the taper, which I overlooked. Will you bring that up now?

William Garstang: I thought it would be well for the members to consider that feature in discussing that paper. I have taken it up with the Wheel committee, and the committee as a whole did not think that we should change the contour. I have explained to you just what has been discovered by Dr. Dudley, and it is for this association to instruct the committee on that point.

D. R. MacBain (L. S. & M. S.): I believe it would be well for the association to consider this matter of changing the contour from one in 20 to one in 38 very seriously before any decided action is taken. About fifteen months ago, as we were coming out of the winter of 1912, during which time we had a great deal of trouble with shelled-out wheels, and various other ailments of wheels, we made a radical step on the Lake Shore. We took two big club cars and went from the standard cone of 1 in 20 to a cylindrical tread, with a view of getting a more uniform or wider bearing on the top of the rail, and thought we would improve conditions that way. We ran the cars about four months, and during the time they were running, we probably changed all the wheels on the cars, and some of them were probably changed two or three times. It is due to flangeway. It is a question if you can take on more flange area, which you will do if you increase the taper, and stand for the additional wear which the present contour gives on the rail.

A. E. Manchester (C. M. & St. P.): We manufactured several thousand wheels which were straight, and we felt that we were getting the proper results in relation to flange way. When we did go, finally, to the coning, while we did it not to be odd, and not to be doing something different from anybody else, we did not do it for the purpose of improving the wheel as we did not feel that way at the time and do not feel so to-day.

A. R. Ayers (N. Y. C. Lines): This question might be illustrated by a report which Dr. Dudley compiled. A few years ago, before the new contour was adopted, they had in service on the Boston and Albany some wide, flat-topped 95 lb. rails. These rails carried about 350 million tons before they were worn out, and the wear was noticeably flat across the top of the tread. After the one in 20 contour was adopted, there was put into service in some parts of the New York Central & Hudson River some 100 lb. rails which only carried from 24 million to 32 million tons, possibly one-tenth of what the other rails carried, and the wear on such rails was noticeably deeper. In my opinion, the one in 38 taper will flatten until it has the proper area for carrying its load with much less actual flattening of the wheel or distortion of the metal than the one in 20, for the reason that in the one in 20, most of the flattening is one way towards the throat, and the taper is such that that portion of the tread outside of the axial theoretical line of contact does not come in contact with the rail to nearly such an extent as if we used the one in 38 taper.

When heavy wheel loads are used, the question is different from what it is with lighter wheel loads, because the wheel must flatten, as your finger flattens if you press it out on the table. If the loads are very heavy, the flattening is greater than with light wheel loads, and while I do not think that Dr. Dudley was at all hopeful that any definite action could be taken at this time, he wanted to have the matter presented before the convention in its full importance. As Mr. MacBain says, it is largely a question of how much rail expense we are willing to put up with in order to save wheel expense, but the difference in wear with the two treads was so noticeable that it is worthy of a great deal of consideration.

William Garstang: I think there is something besides how much rail wear and how much wheel wear we can stand. I think the contour of the wheel does its best service in starting the wheel running right. It is a question whether a contour of one in 20 or one in 38 will do it best.

J. A. Pilcher (N. & W.): We recently had some wheels put under test with varying tapers, and after the first wear the examination seemed to indicate that they had all reached very nearly the same shape. Of course, the wheel that is nearest to the cylindrical form will probably reach that shape earlier than the others, but they quickly come to the shape of the rail. While in the transitory period they are bound to have an influence on the rail in localizing the load on one side, but the indications are that they quickly conform themselves to the shape of the rail where the taper is not too excessive.

President Fuller: Could not your committee take this subject up during the coming year and give it a little more attention before the next convention?

William Garstang: There is no reason why it should not be done. The committee is a standing committee and our object in bringing this matter before the association was that perhaps some of the members might have had similar experiences with Dr. Dudley and we might get something from them.

A. W. Gibbs (Penna.): The inception of this one in 20

taper should not be lost sight of. Up to about 1904, the one in 38 taper was the general one, and the breakage of flanges from seams was advancing in leaps and bounds; it scared us very much. The contour in England and on the continent was 1 to 20. Comment was made by many foreigners coming over here as to the great increase in the side wear of rails, which was one-third greater as compared with their own. The study we made indicated that the formation of the seams was due to excessive loads at certain points. The wheels which were cylindrical or nearly so usually ran with one flange against the rail and the other away from it. The idea of introducing the tapered contour was that the wheels should oscillate, as Mr. MacBain stated, and spread the wear over the whole contour. The results obtained, which were shown by the monthly and annual records of wheel failures, indicated that we did accomplish the result, to a large extent, of preventing flange breakages. It was not only to reduce the flange wear, but to reduce the failure from seamy flanges. I think it has done it, and I believe the wrecks and damages from broken flanges will far outweigh any other consideration, and those we have eliminated, to a considerable extent.

O. C. Cromwell (B. & O.): The remarks of Mr. Gibbs simply bear out the experiences we have had. At one time we operated a large number of wheels of the M. C. B. contour tread and the failure of flanges became very pronounced, and we went to a full coned taper of the tread with a very beneficial result.

D. R. MacBain: I move that the Association instruct the Standing Committee on Car Wheels to investigate the subject further and report at the next convention and find out what the different railroads think about the matter.

The motion was seconded and carried.

AFTERNOON SESSION.

Vice-president M. K. Barnum called the meeting to order at 3.05 P. M. in the afternoon session, June 16.

REVISION OF THE RULES OF INTERCHANGE.

Arbitration Cases 881 to 917 have been decided and distributed to the members during the year and are herewith submitted as a part of this report for approval.

RULES OF INTERCHANGE.

At the suggestion of the Arbitration Committee, a committee from each of the railway clubs was appointed to consider jointly the proposed changes. A meeting of this joint committee was held in Chicago on April 14, at which meeting representatives from the New England, Central, Pittsburgh, Canadian, Western, St. Louis and Southern and Southwestern Railway Clubs were present.

At the request of several members of the Association, representing cars of private ownership, a hearing was given by the committee on May 6, 1913, at which representatives of the following companies were present: Armour Car Lines, Morris & Co. Refrigerator Line, Swift Refrigerator Transportation Co., Cold Blast Transportation Co., Street's Western Stable Car Line, Mather Stock Car Co., Western Live Stock Express, Missouri River Despatch.

Rule 1.—F. C. Schultz, chief interchange inspector, Chicago, and Chief Interchange Inspectors' Association suggest change:

"Each railway company must give to foreign cars while on its line the same care as to inspection, oiling, packing, adjusting brakes and repairs that it gives to its own cars."

The Joint Club Committee concurs in the first suggestion, with the exception that the word "running" precede the word repairs. The Arbitration Committee also approves.

Rule 2.—The committee would recommend that the second paragraph be changed to read as follows:

"Empty cars offered in interchange must be accepted if in safe and serviceable condition, the receiving road to be the judge. Owners must receive their own cars when offered home for repairs at any point on their lines, subject to the provisions of these rules."

The committee recommends Section (b) of Rule 2 be changed to read as follows:

"Cars loaded with explosives shall be handled in accordance with the regulations of the I. C. C.

"Leaking tank cars containing inflammable liquid must be repaired or transferred without any unnecessary movement, or at nearest available point, with least possible risk.

"Tank cars (empty or loaded) shall be rejected if the safety valve is not stenciled to show it adjusted, etc., within the time limit required by paragraphs 5, 6 and 7 of the M. C. B. specifications for tank cars."

The committee suggests that section *C* read as follows:

"Cars improperly loaded, when not complying with the Rules for Loading Material, or when transfer or rearrangement of lading is necessary."

Rule 5.—W. H. Lewis suggests changing the word "shall" to "must" and "should" to "must." The committee approves.

Rule 7.—The Western Railway Club Car Foremen's Association, Chicago, and Chief Interchange Inspectors' Association suggest change as follows:

"When repairs of any kind are made to foreign cars a billing repair card must be made out. This card must specify fully the repairs made and reason for same, the date and place where made and name of road making repairs; also show location of parts repaired or renewed, as per Rule 14.

"If no bill is to be rendered the billing repair card must be attached to the monthly bill, with the words "No bill" written across the face of the card."

The Joint Club Committee does not approve. The Arbitration Committee approves recommendations with the modification that the word "billing" shall precede word "repair" in the first line.

Rule 8.—The committee would recommend that Rule 8 be changed to read as follows:

"The billing repair card shall be made in duplicate, the original to be known as billing repair card and the duplicate to be known as record repair card, and to be on forms shown on pages 103 and 104, the items of repairs to be in handwriting."

J. J. HENNESSEY,
Chairman, Committee on Arbitration.

Rule 9.—The committee recommends that the rule be changed to read as follows:

M. C. B. Couplers, or Parts Thereof, R and R:
- New or secondhand.
- Size of shank.
  - (Where 12¼-in. head coupler is applied or removed it must be so stated.)
- Yoke, stem or key attachment.

Wheels and Axles, R and R:
- Cast-iron, cast-steel, rolled or forged-steel or steel-tired wheels.
- New or secondhand.
- Cause of removal (see Rule 10).

Journal Bearings:
- Solid, filled, or other kind, R and R.
- Length of journal.
- Box number (see Rule 14).

Metal Brake Beams or Parts Thereof, R and R:
- Make or name of beam.
- New or secondhand.
- Complete, or part or parts.
- Cause of renewal.
- Part or parts scrapped.

Brake Shoes Applied:
- Cast or reinforced back.

Triple Valve, R and R:
- Make and type.
  - (Need not be shown when cleaned only.)

Rule *10.*—The committee recommends that after word "groove"

add "or preferably by gage shown on M. C. B. Sheet *C1* of the Recommended Practice."

Rule 13.—The committee recommends changing the rule to read as follows:

"Joint evidence card showing copy of billing repair card, covering wrong repairs, when wrong repairs have been corrected, shall be sent to the company issuing such billing repair card, and it shall issue M. C. B. defect card."

Rule 14.—The committee recommends eliminating from this rule any reference to repair card to conform to action on previous rules. In connection with the recommendation to permit the use of a cardholder, the committee believes that eventually a cardholder will be developed which will satisfactorily answer all purposes, but such cardholder should be a standard of the Association, and the property of the Association for the sake of uniformity. The committee does not agree to the introduction of a diagram for locating defects, as it does not feel that the accurate location and extra work entailed therewith is justified.

Rule 15.—The committee recommends that words "repair card" be changed to read "billing repair card."

Rule 17.—F. C. Schultz, C. I. I., suggests that a pamphlet be issued by the Committee on Standards showing brake beams which meet the M. C. B. requirements.

The Pittsburgh Railway Club suggests adding after the fifth paragraph the following: "Cars built after September 1, 1913, not equipped with either No. 1 or No. 2 brake beams will not be accepted in interchange."

The committee concurs in the suggestion of Mr. Schultz that a pamphlet be issued by the Committee on Standards showing brake beams which meet the M. C. B. requirements, these brake beams to be used on all new cars built after September 1, 1914. The recommendation of the Pittsburgh Railway Club is approved, except that the committee would recommend that the date be changed from September 1, 1913, to September 1, 1914.

Rule 20.—Twin City Club; J. E. Keegan; Central Railway Club; Pittsburgh Railway Club, and Western Railway Club suggest in first paragraph, last portion, eliminate the words:

"Any company finding cars not within the limits of standard height for couplers may repair and charge the owners."

The committee concurs in these recommendations.

Rule 21.—F. C. Shultz, C. I. I.; Car Foremen's Association; Chief Interchange Inspectors' Association, and Western Railway Club suggest adding to rule:

"When repairs are chargeable to car owners."

The committee approves the suggestion, but would recommend that the wording be changed to read, "when owners are responsible for the defective condition of the roof."

Rule 28.—J. E. Keegan, S. M. P., G. R. & I. Ry.; Pittsburgh Railway Club, and Central Railway Club suggest: Change last two lines to read:

"Not stenciled showing the capacity or maximum weight, or limit weight I or limit weight II."

The committee recommends that the suggestion be adopted.

Rule 29.—The committee recommends amending this rule by striking out the words following "applied" as follows: "under conditions which make them chargeable to the owners"; also to amend that portion of rule reading "diameter of journal must be ⅛ in. greater" to "diameter of the journal must be at least ⅛ in. greater," in order to prevent, under any conditions, the application of axles which may be practically worn to the limit.

Rule 33.—The committee suggests that the rule be made vacant, because a car with missing coupler can not be offered in interchange. The charge which may be made for missing coupler, etc., is provided for in Rule 95.

Rule 36.—Canadian Railway Club: New rule, under delivering companies' defects:

"No car to be accepted in interchange with journal bearings other than M. C. B., standard on cars built after September 1, 1914."

The committee approves of this suggestion.

The committee also recommends a new rule as follows:

After September 1, 1915, cars not having stenciled on them the date when built new, will not be accepted in interchange.

The committee at the request of the General Managers' Association would recommend a new rule as follows:

After September 1, 1914, no car carrying products which require for its refrigeration the use of ice and salt will be accepted in interchange unless equipped with suitable device for retaining the brine between icing stations.

Rule 37 to 42, incl.—In regard to various recommendations made to eliminate the combinations under Rules 37 to 42, inclusive, the committee feels that this change would be too radical to be justified at the present time.

It, however, recommends the elimination entirely of Rule 38, because there are very few cases in which the damaged pocket is a factor, except when due to local weak design or inferior material. Similarly, the reference to the pocket in Rule 39 should be omitted. The committee also suggests the omission of the reference to the coupler attachment in the second note at bottom of page 30, following Rule 42.

Rule 43.—The committee suggests the following change:

Owner's Responsibility

"Any damage to the underframe of all-steel or steel underframe cars, unless such damage occurred in wreck, derailment, cornering or side-wiping, and except unconcealed fire damage."

Rule 44.—The committee recommends that Rule 44 be made vacant for the reason that under Rule 2 such cars should be rejected in interchange.

Rule 49.—The committee recommends the omission of reference to repair card and the addition of joint evidence cards in this rule.

Rule 50.—W. H. Lewis suggests that this rule be eliminated, as it is covered by Rule 20. The committee approves the suggestion.

Rule 51.—W. H. Lewis suggests that this be eliminated, as rule 18 covers it.

The committee suggests that the rule be made vacant.

Rule 52.—The committee suggests changing the first paragraph to read:

"Running boards in bad order or insecurely fastened. Bolts, rivets or screws be used on parts repaired.

Also, change third paragraph to read:

"Handholds or grabirons must be of wrought iron or steel. In applying on repairs they must be secured by bolts or rivets.

Rule 53—The committee suggests that the last line of this rule read: "Also quick-action triple valve, pressure-retaining valve and an efficient hand brake."

Rule 54.—The committee recommends that this rule be eliminated, for the reasons given under Rule 33.

Rule 56.—J. E. Keegan, S. M. P., G. R. & I. Ry.; Central Railway Club, and Western Railway Club suggest substituting Rule 66 in order to place it in its proper place.

The committee approves the suggestion, namely, placing the rule under Rule 56, now vacant, thus putting the rule in its proper place.

Rule 57.—The committee suggests that this rule be changed to Rule 58, and be changed to read as follows:

Delivering Company Responsible

RULE 58. Missing air-brake hose; missing or damaged cylinders, reservoirs, triple valves, angle cocks, cut-out cocks, brake pipe strainers or dirt collectors, pressure-retaining valves, release valves, pipe, pipe fittings, or any parts of these items, except as specified in Rule 59.

Rule 58.—The committee recommends that Rule 58 be changed to Rule 57 and that the first note following the rule be omitted.

The committee recommends that second note following present Rule 58 be amended as follows:

The committee on air-brake hose specifications will submit to the association recommendations for new air-brake hose label, and if the association adopts this label the arbitration committee recommends that after September 1, 1914, no new hose should be purchased or applied unless it bears the revised label, it being understood that the adoption of this recommendation will not penalize any hose now in service or in stock at this time.

Rule 59.—The committee would suggest a revision of this rule as follows:

Owners Responsible

RULE 59. Air hose burst, torn or worn out; air hose labels illegible or missing from wear; air-hose couplings that become defective in fair usage; release valve rods defective or missing; leaky pipe or pipe fittings account rust or seams; broken pipe or pipe fittings account insecure fastenings; defective interior parts of cylinder or triple valve; failure or loss under fair usage of other parts of brakes.

Rule 62.—The committee recommends the elimination of the words "and so labeled" and to allow the balance of the rule to remain as it is.

Rule 65.—The committee recommends change in Rule 65 as follows:

"Journal bearings (regardless of previous condition) and journal-box bolts which require renewal, when delivering company is responsible for change in wheels and axles."

Rule 68.—The committee recommends changing this rule as follows:

"Fast sliding, cast-iron or cast-steel wheels, if spot is 2½ in. or over in length, or if there are two or more adjoining spots, each 2 in. or over in length, the same responsibility to apply to mate wheel, regardless of length of slid spot."

Rule 86.—The Pittsburgh Railway Club suggests adding the 6 in. by 11 in. axle to this rule:

"FOR CARS MARKED WITH CAPACITY:

Capacity.	Journal.	Wheel Seat.	Center.
140,000	5½	7⅜	6 7/16

FOR CARS MARKED MAXIMUM WEIGHT:

210,000	5½	7⅜	6 7/16

FOR TANK CARS MARKED LIMIT WEIGHT I.

210,000	5½	7⅜	6 7/16

FOR TANK CARS MARKED LIMIT WEIGHT II.

210,000	5½	7⅜	6 7/16

This is approved by the committee.

Rule 89.—The committee recommends the elimination of Rule 89, for the reason that amended Rule 13 covers this rule.

Rule 90.—The committee recommends the elimination of the first paragraph of Rule 90, as it is already provided for in Rule 13, and would also recommend eliminating the third paragraph of Rule 90 on account of the abolition of the repair card.

Rule 93.—The committee on conference with the association of american railway accounting officers suggests changing rule to read:

"Separate bills must be rendered for cars destroyed. All charges for repairs made to cars account of owner's defects, defect cards and rebuttal authorities must be consolidated against any one company into one bill.

"Separate statements to be made:

"1. For owner's defects for each calendar month.

"2. For all charges based on defect cards, including rebuttal charges.

"NOTE.—Totals only of these statements to be shown on the recapitulation."

The committee recommends that present Rule 93 be abrogated, and recommends in its place that new Rule 93, as proposed by the joint committee from the M. C. B. Association and the Association of American Railway Accounting Officers, be adopted.

Rule 95.—The committee recommends the restoration of the third paragraph of this rule shown on page 56 reading:

"Brake levers, lever guides, top and bottom brake rods, whether or not they are lost with the brake beam" to comply with changes made in previous rules and because it is only consistent to feel that if the brake beam when lost is in good condition, the further details as stated above should also be in good condition.

Rule 99.—The committee recommends that this rule read as follows, in order to make it plainer and to conform to Rule 86:

"If car owner elects on account of improper repairs to remove M. C. B. standard axles suitable to the marking of the car, he shall make charge for secondhand axles, and allow credit for secondhand axles if they are in good order. If M. C. B. standard axles unsuitable to the marking of the car are removed, they should be credited as scrap regardless of their condition. Axles removed below the journal limits for cars marked capacity, limit weight or maximum weight, as per Rule 86, should be credited as scrap when removed."

Rule 104.—The committee recommends changing Rule 104 to read as follows:

"Secondhand M. C. B. coupler or parts, or secondhand metal brake beam, may be used in repairs, but must be charged at 75 per cent. of value new.

"Secondhand M. C. B. coupler or parts removed, must be credited at 75 per cent. of value new. Credits shall be confined to the body, lock, knuckle and knuckle pin, whether secondhand or scrap.

"Secondhand parts of metal brake beams removed must be credited at 50 per cent. of value new.

"In applying new M. C. B. coupler or new metal brake beam it shall be so charged, whether or not it be of same make as that removed."

Rule 106.—The committee suggests the elimination of revised Rule 106 as shown on Circular No. 8 giving result of letter ballot on changes in the rules, and restoration of old Rule 106. (See page 66 of the 1912 code) reading as follows:

"No percentage to be added to either labor or material."

Rule 111.—The committee recommends the following change at the bottom of page 86 and top of page 87:

The following basic units must not be used in rendering bills in the foregoing schedule but may only be used in determining cost of other combinations of air-brake repairs not mentioned, for the reason that the present wording is misunderstood.

Rule 112.—The committee recommends rewording this rule, as follows:

"The company on whose line the bodies or trucks are destroyed shall report the fact to the owner immediately after their destruction, and shall have the option of rebuilding or setting for the same."

Rule 115.—The committee approves the recommendation eliminating word "axles" in the second paragraph and concurs in the recommendation changing word "designate" to "nearest," for the reason that such change is in accordance with conference ruling No. 224 of the Interstate Commerce Commission.

The committee suggests changing the last paragraph to read:

The underframe of damaged steel and steel underframe cars, when intact and in serviceable condition, may be forwarded to the owner on defect card, in which case it must be accepted by the owner.

Rule 120.—The committee recommends that wording of the first paragraph of this rule be changed to read as follows:

"A car unsafe to load account of general worn-out condition due to age, decay or corrosion, shall be jointly inspected by the handling line and a representative of owner or a disinterested line whichever can be most conveniently obtained by handling line. If inspectors agree that home route cards are justifiable, joint inspection statement shall be sent to owner, showing in detail all defects found on car, also an estimate of cost of temporary or partial repairs necessary to make car safe to move. Upon receipt of this information, owner shall either furnish two home route cards or authorize destruction of car. When issuing home route cards, car shall be short-routed per Car Service Rule 3, paragraph (f), at owners' expense, and owner shall be responsible for necessary repairs to make car safe to move. If owner elects to have car destroyed, the handling line shall allow credit for all material at M. C. B. scrap prices, less labor cost of destruction.

"The joint inspection and home route cards will apply in cases of direct or indirect connection except where car is already at junction point with car owner's line, in which case owner must accept car per Rule 2."

Rule 121.—The committee recommends that rule 119 be consolidated with Rule 121, and that the consolidated rule read as follows:

"When the body or trucks of a foreign car are destroyed in wreck or accident, the owner shall, upon request, furnish statement of depreciated value of body and trucks separately.

"If the car is not destroyed, and the owner elects upon request, to furnish home route cards for its movement it shall be short-routed as per Car Service Rule 3, paragraph (f) to point designated by owner, at the expense of the company on whose line the car was damaged. A joint inspection should be made at said designated point, and settlement made on the basis of the M. C. B. rules."

Rule 131.—The committee suggests that the new rules go into effect October 1, 1913, for the reason that under the operation of the rules from January 1, only about three months' experience would be had with them prior to having recommendations made for changes in the rules.

PASSENGER CAR RULES.

Appendix—Rule 3.—The committee recommends that icing and lubrication be stricken from the items forming line expenses, for the reason that each line interested should be individually responsible for lubrication and icing while the car is on its line. Terminal cleaning is accepted because cleaning of this character is only done at the point where the car starts.

Appendix—Rule 6.—The committee suggests changing rule to read:

"Each operating line at interest may charge one journal bearing only per journal per trip. The following information must be specified on billing repair card or on the bill itself:

"Whether solid, filled, or any other kind, removed and replaced.

"Length of journal.

"Box number."

Appendix—Rule 12.—The committee on train lighting suggests that the following instructions covering repairs to electric-lighting equipment on passenger cars be added to Rule 12, page 129:

"For repairs to electric-lighting equipment on cars in interchange or leased cars, the instructions issued by the manufacturer of the apparatus should be strictly adhered to. In the absence of any agreement, the material furnished and applied must be of the manufacturer's make."

The committee approves the above suggestion.

The report is signed by:—Jos. W. Taylor, *Secretary.*

Chairman Barnum: This special session is called to take the place of the conference that has hitherto been held in the Marlborough-Blenheim Hotel on the afternoon or evening of the first day, to canvass the Arbitration committee's report prior to its presentation by that committee at the regular session of the second day. This action is in accordance with a suggestion made last year for the purpose of obtaining a record of the discussion on the changes in the rules.

The Arbitration committee has had an unusually arduous series of meetings during the past year, not only for the purpose of considering the arbitration of cases, but especially on account of the large number of changes that were suggested in the rules. There were, I believe, 280 changes in

the freight car rules, which number 131. These changes applied to about 95 of the 131 rules, and while the suggestions have in many cases not been adopted, they have, we believe —I say that as a member of the Arbitration committee— been very carefully considered.

To show this I wish to state that at one time the Arbitration committee met for seven days ,and altogether did nine days' work in actual sessions on this report, in addition to the time spent traveling by those members who live outside of Chicago, and some extra work that was done outside of the meeting. You can, therefore, understand the problem that was presented to them, and if there are some changes recommended which have been disapproved, or some changes which have been approved that did not meet with your ideas, you will appreciate that it is not surprising.

In order to give the utmost consideration to all suggestions, the Arbitration committee held two separate meetings to discuss propositions made by the private car line representatives for some changes in the rules as they were in effect last year, and for some objections to changes that were proposed in the rules as covered by this report; as the result of these conferences, considerable modifications were made in the original form of the report.

It has been the object of the Arbitration committee in revising the rules this year, to make as few changes as seemed necessary to bring them up to date, and at the same time keep them as simple as possible to avoid any unnecessary complications. One suggestion, which may not be understood, was that the rules be changed to go into effect October 1, instead of November 1, as heretofore. The object of that was to give the secretary more time to get the rules printed and distributed, and also to give the railroads more opportunity to post the inspectors on the changes in the rules. September 1 has left insufficient time to get the rules out and have them well discussed before they went into effect. That will be one of the recommendations which you will be asked to pass upon.

The first part of the Arbitration Committee's report covers the cases arbitrated during the year. Arbitration cases 881-917 have been decided and distributed to the members during the year, and are submitted as part of this report.

I. S. Downing: (L. S. & M. S.): I move they be accepted. The motion was seconded and carried.

Chairman Barnum: The secretary has a communication which he will read to you. The Arbitration committee has been advised that Rule 30 has been acted upon by the American Railway Association and if you will turn to the report, the committee wishes a change there, recommending the adoption of American Railway Association Rule 11. That is the rule in regard to weighing cars, and when our report was made, we did not understand that that rule had been finally settled upon.

I have already said that the Arbitration committee had met the representatives of the private car lines on two occasions and discussed some changes which were made in the rules, and as they still feel that there are certain rules which affect them seriously, and which are not in the form at present shown in the report, they are not altogether satisfactory. The Arbitration committee, with your approval, will follow the plan that the private car line representatives be given a hearing at the beginning of this meeting on those rules which are especially applicable to them, and the secretary will read the communication which they have sent.

Secretary Taylor then read the following communication:

To the Members of the M. C. B. Association:

The undersigned companies, after representing to the various committees who have had charge of the changes in the M. C. B. rules of interchange, find that certain recommendations will be made to this convention which will affect most materially the operation of the cars we represent.

By reason of the non-reciprocal arrangement as between cars of individual ownership and railroad companies, these changes discriminate against the individually owned cars in favor of the railroads. We recognize the fact that it is not in our province to dictate or interfere with any code of rules covering the handling of railroad companies' cars; we only ask that when the reciprocal feature does not exist that exceptions be made for our relief.

The various changes which have been made in the rules in years past have increased the expenses to such an extent that we are now frankly stating to the association that the recommended changes will prevent the continued operation of cars of individual ownership except at a loss. We do not believe that it is the desire of the association to legislate out of existence this special equipment, and we request your earnest consideration of the question involved. Therefore, we present hrewith a list of our objections and ask the association to give us the relief which we must have:

Rule 4.—Do not omit reference to rules 33 and 55.

Rules 33-55.—Do not eliminate these rules.

Rule 64.—Reinstate as in effect previous to Nov. 1, 1912.

Reason.—So far as the railroads are concerned, the elimination of these rules as proposed is reciprocal, but on cars of individual ownership such arrangement does not exist and therefore protection should be given. This can be accomplished by continuing the reference to rules 33 and 55 in rule 4, by retaining rules 33 and 55, and restoring rule 64 as in effect prior to November 1, 1912, making such provision as will restrict the application to cars of individual ownership if so desired.

Rule 36.—Referring to application of brine retaining tanks, time allowance is entirely too short. The perfecting and application of a device satisfactory for the safe handling of lading cannot be accomplished in the alloted time.

Rule 94.—Change the last sentence to read—"but no bill shall be rendered unless repairs are made or car withdrawn from service." The reason is this. In view of the growing sentiment to withdraw light capacity cars it is unjust and inconsistent to require that they be repaired before owners can recover on defect card covering badly damaged cars.

Rule 98.—Restore price of second-hand wheels and make no change in labor charge for application.

Reason: It is unfair to car owners to allow scrap value only for second-hand wheels removed. The present labor allowance is ample to cover cost.

Rule 117.—Add to proposed changes on depreciation of wooden car bodies (first paragraph), "except cars covered by rule 118." Make no change in seventh paragraph of 1912 rules.

Reason: Cars designed for special purposes must be frequently rebuilt to protect their lading and consideration should be given this rebuilding in figuring their depreciation which at most does not exceed six per cent. yearly or 60 per cent. of their total value.

The communication is signed by Armour Car Lines, Swift Refrigerator Transp. Company, Morris & Company, Cold Blast Transportation Company, Kingan Refr. Line, St. Louis Refr. Car Company, American Cotton Oil Company, Street's Western Stable Car Line, Pacific Fruit Express and German American Car Company.

Chairman Barnum: In order to make definite progress in this work, I think we better take action as we proceed, on each recommendation separately. I think it will not be necessary to make separate motions on these rules; it is agreed that the business of the meeting is to consider them in order. We might first hear from the representatives of the private car lines as to their reasons for making the recommendations.

DISCUSSION.

H. L. Osmond (Morris & Co.): The members of the private car lines represented here and at the meeting before the Arbitration committee, were given every consideration by that committee, but at the same time there has been enormous pressure brought to bear by railroad companies with the idea eventually of making everything an owner's defect, wrecks and derailments, perhaps, excepted.

I want to repeat what we said in our communication to you. We realize it is not our business what rules you make as to the handling of your affairs, but we at the same time are compelled to furnish a special equipment for the handling of our business, and when we offer you a car, it is subject to your, and only your inspection, and everything must be on that car before you will accept it. If there is anything missing, or any defect which you feel makes a car unsafe to run, you refuse to accept the car. We are absolutely powerless, but it seems to us that it is no more than fair to return that car after it is unloaded at its destination, in as good conditions as you take it from us, ordinary wear to be excepted.

F. F. Laughlin (Armour & Co.): We appreciate the conditions and circumstances under which the Arbitration committee has worked in making rules that will take care of the interchange of cars as between railroad companies, and it is somewhat unfortunate that we have to have our cars in this interchange; but it is a necessary condition.

These suggestions have been made to take care of the cars of individual ownership, the idea being that this missing material can be taken care of at our expense while it is on your line. Its waste does not benefit anybody and it is a very large item of expense to us. It means that we have to accept the cars home with this material missing or lost when, by a little care, probably, on the part of the handling line, you would be able to preserve and restore the car to us in good condition, and at our expense.

H. L. Osmond: There is one thing I omitted to say, and that is with relation to the financial question. I do not know whether you gentlemen realize the position we are in. To start with, we are forced to build this special equipment. There has been absolutely no change in our compensation for the use of these cars for years past: on

the other hand, our average haul and in consequence, our earnings, are decreasing every year. We earn nothing like as much on these cars as we used to; one of th reasons is that America has lost the English dressed beef trade. We have been driven out of the market by the Argentine; they can raise cattle cheaper than we can in America. We have had to hunt up a market in this country to take care of our output. We have established branch houses at nearby points through our packing centres. In the year 1912, we shipped over 3,000 carloads of beef to branch houses in Chicago, on which we derived not one cent of revenue. In addition to that, we shipped over 6,000 carloads of dressed beef to nearby points in so-called refrigerator cars. These cars average a haul of 74.7 miles each. In addition to our earnings going down all the time, you all will admit that the changes which have been made in these M. C. B. rules, under which we have to live, have increased our expenses until today, the points of shipment being so near together, we are literally struggling for existence.

We have had to make reports to the Interstate Commerce Commission, and I showed for the year 1912 earnings of 4.71 per cent. on the money invested in our car lines. So far this year, covering the first five months, the average bills against us have increased 80 per cent. over the first five months of 1912. We have got to the point this year where I doubt very much whether we will be able to show 2½ per cent. I believe you will admit we are entitled to a fair return on the money invested in these cars.

J. J. Hennessey (C. M. & St. P.): In the Arbitration committee's report, we gave the reasons why we did not concur in the various arguments which came to us, and I feel that it is up to the convention now to talk. We put in an enormous amount of labor trying to get these rules to harmonize and we tried to be as just as possible.

F. W. Brazier (N. Y. C. & H. R. R.): The gentleman who last spoke must admit that the equipment is in bad shape, as the bills coming in are so heavy. Since we have been here we have had four cars out of one of our trains for defective arch bars; that will go in as repairs against owner of these cars.

A. LaMar (Penna.): I would like to answer Mr. Brazier on that point. You all know our labor is costing more than it did a year ago, and so is material, and I will leave it with Mr. Brazier to say if our equipment is not in better shape than it was a year ago.

J. J. Hennessey: That is what I wanted to bring out—whether you thought these were real repairs, or whether you thought we were making "pencil repairs" as someone has designated them.

T. W. Demarest (Penna. Lines): If I understand the proposition of the car lines in reference to rule 4, it is the re-establishment of rules 33 and 55. If you will consider the reasons given for the omission of these rules, I think you will be in a position to answer as to rule 4. As to rule 33, it covers the missing couplers, and you cannot offer an interchange of a car with a missing coupler; they also understand that you cannot offer an interchange of a car with a defective brake attachment, and for that reason they have asked for the omission of rule 55. If their understanding is correct on those two details, you must omit the rules; those reasons are given in their report.

I. S. Downing (L. S. & M. S. Ry.): Where?

T. W. Demarest: Under rules 33 and 55.

I. S. Downing: There are just two reasons, one is improper workmanship and the other is lack of care. I do not see why the private line people should not stand for a missing hook or a missing brake hanger or shoe. If the private line is responsible 40 miles away from a point where interchange takes place, they are responsible there; I think the Arbitration committee's recommendation should be adopted.

M. F. Covert (Swift & Company): The cars could not be offered in interchange; I do not know what was meant by interchange movement. We have a considerable number of cars returned to us with brake beams and shoes missing, which were torn off, no doubt, by some obstructions on the track. I do not see why the private car line should not be re-embursed for that when the car is returned; and if the railroads repair and replace that material at their own expense, instead of sending the car home to us, there would probably be no objection.

T. W. Demarest: Mr. Covert, you are talking about the rule as it is at present. If you omit that rule, you will not get your car home with a brake beam missing. The handling company will repair that and charge you under rule 95.

E. Chamberlain (N. Y. C. Lines): The gentleman has made a statement representing the private car line. I am in doubt as to whether the 80 per cent. of equipment controlled by this company has had steel underframes and betterments of that character, and as to the increase of M. C. B. bills. Perhaps the gentleman can throw some light upon the character of the bills that accumulated. The natural sequence would be when you placed a steel underframe under the car and made other betterments, that your M. C. B. bills would be less. I cannot quite assimilate the reasons.

M. F. Covert: As I understand, Mr. Demarest, rule 95 has gone back, and you make the handling line responsible for the missing brake material?

T. W. Demarest: The present rule 33 reads as follows: "Material missing from bodies of cars offered in interchange, except grain doors, water troughs and attachments, all inside parts or concealed parts of cars; also nuts, body truss-rod, saddles on bolsters, roof boards, side and end fascia, wooden door caps, hatch covers, vent slides and ventilated side and end doors, unless the car is stenciled for such door." Now, if that rule is omitted, the delivering company cannot give you your car home with that material missing, but they must supply the material and bill you under rule 95 for the labor only. So you only get your car home in the condition provided for in rule 33 for the reason that the Arbitration committee believes it is not the intent of the rule to deliver the car home with defective material. That is in reference to rule 55, but in rule 33 it is the missing coupler. If that is understood, rules 33 and 55 should be omitted and private car lines would be benefited.

T. H. Godnow (C. & N. Y.): The only injustice done the private car lines is in the question of credit. If you tear their brake beam or other parts from the car, you will have that in your possession. It is true you can make the repairs and deliver the car and they have to stand for the bill. As I understand it, they want to get a defect card when the car is delivered. It seems to me that if an individual car owner got some credit for the parts in the possession of the railroad company, it doesn't make any difference whether the railroad makes the repairs and bills for it, or the owner takes the car himself and makes the repairs.

T. W. Demarest: I would again like to call attention to the fact that the discussion does not pertain to whether rules 33 or 55 should be omitted from rule 4. If the Arbitration committee's reasons are good, the rules must be omitted; and it seems to me there should be no further discussion.

Chairman Barnum: I think it is for the benefit of all concerned to have as thorough a discussion as possible; if there are misunderstandings, this is the time to clear them up.

T. H. Goodnow: There is a lot of material which has not been charged when mssing, but has been credited as interchange. The question of the missing roof is accepted as a defect, and the coupler we cannot deliver unless under special arrangements we go to our own shops.

F. H. Stark (Montour Railroad): I appreciate that we are a little out of order in talking on this rule; but the private car interests are after some redress in some manner. I appreciate that the Master Car Builders themselves are not in position to correct matters so as to make the ownership of private cars break even. We have heard here to-day regarding the earnings on refrigerating cars, in which they state that they doubt whether they can make 2-½ per cent. There was a time when the railroads failed to provide equipment for carrying coal, and the coal operators were induced to purchase cars. Later on, the Interstate Commerce Commission wiped out all the special consideration accorded to the private car owners, and today any company that owns coal cars will lose.

We might say "Missing material is owner's responsibility, except when offered to the owner." That will not do because it will put the burden on the delivering line, and I do not see how this association can correct the trouble, I would suggest that the matter be referred to a committee for their consideration.

The Interstate Commerce Commission is getting data on the purchase, cost of maintenance and revenue from private cars, and as a matter of fact, people owning coal cars cannot help but sustain the loss anywhere from $30 to $50 a car per year under the present conditions. They do not get their own proportion of the railroad company's equipment; they have to take all classes of cars, including cars owned by other private lines. They are the victims of circumstances, and I do not see how you can correct the trouble without having it go before the American Railway Association as to the matter of increased compensation.

The cars are sometimes held two months in a switching district, which in some cases includes 40 miles, and the owner does not get any compensation whatever, and has to pay for all the necessary repairs to the cars while they are in the switching district.

Chairman Barnum: I will state on the part of the Arbitration committee that it was suggested at some of the conferences

we had that an exception be made in the case of the private car lines, and that we make a rule covering the interchange of cars between the railroads, especially covering the missing material, and where these cars belong to private car lines make an exception when the car was returned to the owner. That matter was considered carefully, and discussed thoroughly, and the Arbitration committee felt that it would be inconsistent. This is a very important subject, and the Arbitration committee has been, theoretically, lying awake nights over it, and we should have a full discussion, because everyone here is interested as well as private car lines. It is a matter that is worthy of very careful consideration, and I think we should take plenty of time to thresh it out.

T. W. Demarest: In reference to the point brought out by Mr. Barnum, as to the feasibility of making one set of rules to cover private line cars, and another set to cover railroad owned cars, I think every member of the Arbitration committee consulted with the legal department of his road before giving that thought up. As a result of such consultation we did not feel it advisable to make any difference between the treatment of a private car line car and a railroad owned car, in interchange.

H. L. Osmond: I fail to see why an exception cannot be made in favor of the private car lines. You start out and take our cars on a mileage basis, which is certainly different from the basis on which you settle among yourselves for the use of railroad cars. In setlting for a destroyed car, while it is settled for according to M. C. B. rules, it is a different method of settlement than for a destroyed railroad car.

Chairman Barnum: I think you are mistaken. It makes no difference whether a refrigerator car is owned by a railroad company or a private car line, it is settled for on the same basis.

H. L. Osmond. The fact is you settle for the use of the car on a different basis.

E. Chamberlain: Will the gentlemen give us a concise idea on the cause of the increase in his bills? Why has there been an increase in the M. C. B. bills, and for what defects were these bills incurred?

H. L. Osmond: We do not claim that our equipment is in an ideal condition. I do not think anyone has equipment he thinks is in an ideal state.

E. Chamberlain: You do not claim the highest degree of efficiency; you say that 80 per cent. has been equipped with steel underframes.

H. L. Osmond: Yes, 80 per cent. has been equipped with steel underframes.

E. Chamberlain: Why, then, the enormous increase and accumulation of bills?

H. L. Osmond: The traffic is heavier.

J. J. Tatum (B. & O.): I have always had a great deal of confidence in the consideration which the Arbitration committee has given to matters of this sort. It has been said that the enormous accumulation of bills is due to the present M. C. B. rules, and it has also been said that 80 per cent. of certain equipment has been improved by applying steel underframes and side truck frames, and that the cost to maintain the equipment has come almost within five per cent. on the investment. May I ask if the cost of maintaining this equipment has actually resulted in but a five per cent return on the investment? It may be that the application of these steel underframes and side truck frames and other betterments applied to the cars has added to the cost and reduced the earnings on the investment; but later on, the advantages to be obtained from these betterments will reduce the expense of maintenance.

I am inclined to believe that the right course to take is to refer the matter to a committee. We should find what is the real cost of maintaining private line cars under the M. C. B. rules in effect, in accordance with the billing for repairs and with these renewals, and we should find what these betterments are costing; we can then tell what the earnings are on the money invested.

H. L. Osmond: I want to make it clear to you, gentlemen, and especially to Mr. Chamberlain, that we have not increased 80 per cent. in our total expenses the first five months of this year as compared with the same period of last year, but it is an increase in the railroad bills against us.

I will answer the last speaker by saying that we do not charge to car repairs, the cost of steel truck sides or steel underframes. That is charged to equipment account.

M. F. Covert: Five years ago, the cost of maintaining our cars, not including any betterments, steel underframes or steel truck sides, was around $75. and now it is $115. per car.

H. L. Osmond: Mr. Stark suggested a committee to investigate this private line question. I do not believe you gentlemen realize what we are up against, but we are trying to make it plain to you. We said to the Arbitration committee, when we gave them figures, that we would be glad to have them go over our books. We are entitled to consideration, and I, for one, will be glad to see a committee appointed.

W. T. Demarest: The rules as proposed by the Arbitration committee this year are more in favor of the private car owners than the rules they are working under. Whatever changes have been made, have been made in their favor.

W. T. Demarest: When you gentlemen appeared before us in Chicago, you made one strong point about brake material which was missing from trucks. That point was particularly emphasized, and we have covered that in rule 95. by restoring it to what it was before November 1 last.

M. F. Covert: There is a point I do not understand, as to what is to be done with cars delivered with this material missing. How will you get it? The rules, I think, prevent those deliveries.

W. T. Demarest: We are talking about the proposed changes and not the present rule.

M. F. Covert: There are a lot of railroads delivering to us in Chicago, and the cars have to go eight or ten miles. If they tear off a couple of brake beams in our yards, then that material is missing. Are we to send the car back? They have no inspectors.

J. J. Hennessey: This expression of "tearing off material" is worth while making an answer to. Tearing off a brake beam is unfair usage, and a railroad is responsible for anything in the way of unfair usage, and if the private lines do not protect themselves, they are responsible.

C. R. Ord (C. P.): It is not clear just what the private car lines are suggesting in reference to the particular rule of interchange under discussion. It will appear that the discussion on the matter is unnecessary if they take the necessary steps to protect themselves. It would be my understanding that they have the right to refuse to accept a car with that material missing, to comply with the interchange rules in the two cases referred to. If there is any necessity for further discussion I would like to know just what definite recommendation they have to make regarding the rule.

H. Boutet, (Cincinnati Rys.): A good deal of reference has been made to missing brake material. One of the speakers referred to three or four cars being cut off on his line since he was here. I kept a record of brake beams falling on one division and I find that two brake beams have fallen. Upon investigating these cases, I found that the rods were of malleable iron, and all the outer casting of the iron was eaten off; they failed to keep the car in proper condition, the draw-bars fell down, and we had to break up the car. If the private car owners would take better care of the cars, they would not have so much missing material, and we would not be called upon to make repairs as often as we are.

M. F. Covert: That brings us back to the point where the railroads have the benefit of making the inspection. If it is not safe to return the car, you can make repairs and charge the owner.

T. H. Goodnow (C. & N. W.): I would like to see any railroad or private car line in Chicago start in and refuse to receive cars because a brakebeam is missing. If the car is left at the repair point, the receiving road has the right to take it and put the brakebeam on, whether it is a private car line or not.

F. W. Brazier: I think we are satisfied with the explanation made, that there is no great hardship in adopting the recommendation of the Arbitration committee.

H. L. Osmond: I have not been convinced in any way, and to bring this matter to a focus, will move that the president appoint a committee to investigate this entire question, and that in the meantime, we continue on the present code of rules.

D. F. Crawford: If I understand this situation, this book of interchange rules assumes to legislate for cars and not for the earnings of cars. The gentlemen have very properly stated that their earnings are insufficient to meet their expenses, and therefore they need some increase in rating. The M. C. B. A. has no authority whatever over the situation, as representatives of the railway companies, to appoint any committee to look into the question of the difference between the earnings and the expenses of the private car companies. The American Railway Association is the only association that I know of that can take up that subject. As I see it, the question before us is, is this a proper code of rules, to interchange cars, to keep them moving in interchange and in safe condition to haul a load? Each company owning the cars bears its share of the burden in keeping them in a safe condition.

As to the appointment of this committee, or to any investigation, I am heartily in favor of any investigation that will bring

out the facts, but as I see it, a motion cannot be entertained by the chairman to give consideration to the difference between expenses and earnings of the private car lines.

Chairman Barnum: I think Mr. Crawford is absolutely right in his point of view, and in regard to the matter of missing material, the idea all the way through has been that that material will not be missing under fair usage from cars that are well built and properly maintained. That principle has been growing in the development of the interchange rules during the last few years, and many of the members of the M. C. B. Association with whom I have talked, feel that they should be carried even further than they have been up to this time; but in the application of the principle, it has been modified to some extent in this report in order to make such concessions as seem possible and consistent to the private lines where there was a question as to whether they would suffer more than the railroads would in extending that principle.

D. R. MacBain (L. S. & M. S.): While the gentlemen from the privately owned car lines are speaking of their increasing expenses, I wish to mention the increasing expense of betterments and the providing of facilities for the movement of cars that the railroad companies are standing up under. I think the provisions and suggestions made by the Arbitration committee are absolutely just, and would move that the recommendation of the Arbitration committee as regards rule four be approved.

M. F. Covert: So far as this association is concerned, it might disregard the financial side of the thing, but I would like to appeal to the members to consider what it means. Is it right or wrong to take my car and lose material off it and bring the car back to me without giving me a cent for the lost material? That is the proposition, so long as the financial end is not to be considered by this association.

Chairman Barnum: I do not feel authorized to answer the question, but from what I have gathered from the discussion, it is not the intention or proposition to do that.

Mr. MacBain's motion to adopt a report of the committee on Arbitration with reference to rule four was put to a vote and adopted.

Secretary Taylor: The next suggestion is: Rule 4; do not omit reference to rules 33 and 55; rules 33 and 35 do not eliminate these rules.

Chairman Barnum: Unless there is some objection, I make the ruling that this matter is involved in the motion of rule 4.

Secretary Taylor: They also ask rule 64 to be reinstated as in effect previous to November 1, 1912.

Chairman Barnum: I think this calls for separate action.

J. L. Hodson (Grand Trunk): Does not action on rule 4 cover that? It says "Any missing material." It does not specify what material.

Chairman Barnum: There was a question in my mind as to whether it did or not.

J. L. Hodgson: I move that the action on rule four be taken as covering the recommendation for rule 64.

The motion was seconded and carried.

Secretary Taylor: The private car lines state as follows

Rule 36: referring to application of brine retaining tanks. Time allowance entirely too short; the perfecting and application of a device satisfactory for the safe handling of lading can not be accomplished in the allotted time.

Chairman Barnum: Will the Arbitration committee explain their action in regard to that?

J. J. Hennessey: We have made our recommendation.

Chairman Barnum: You have the recommendation of the Arbitration committee, and the request of the representatives of the private lines. What do you wish to do about this rule?

H. L. Osmond: In explanation of our request, you gentlemen know what kind of stuff we ship; it is perishable freight. We have got to protect that freight. We give you a carload and you do not touch it. You simply hook an engine to the carload, and away you go with it. It is up to us not only to load the car at our own expense, but ice it, and see that our refrigerating plant in the car is in proper shape to take care of the load. I want to assure you that we have been working hard on that question and we have not tried to dodge this issue at all. We were willing to go ahead and equip these cars with brine retaining tanks, but we cannot do it in the time you have given us.

Chairman Barnum: How long have the packing companies been working on this proposition already?

H. L. Osmond: Morris & Co. have worked on it for over two years. We had to get some kind of a device that is fool-proof and could not be tinkered with from the outside, and our brine allowed to escape. We have been applying this device to every car that we have put through our shops, and that means, that we have to throw away half the ice tanks that are in these cars, because when you couple up two tanks with this valve, unless your tanks are in good condition, they will not stand the connection. If we put the new ice tanks in our cars, it means an expense of $64, and these rods and valves that we are putting in cost $18 a car; that is an expense of over $80 on every car. We have got to pay for that out of our earnings and the camel's back is pretty nearly ready to break.

Chairman Barnum: About what per cent. of your company's cars have been equipped with this arrangement?

H. L. Osmond: On our beef cars we have equipped less than 10 per cent. We first had to find the device. You must get something that will not freeze up, to start with you have to test a device for a year before you know that it will serve your purpose.

M. F. Covert: We have 788 cars fixed up to date.

Chairman Barnum: What per cent. is that of the total?

M. F. Covert: About 3 per cent. of the beef cars and about 8 per cent. of the total number of cars. It is only recently that we have been able to get anything that was satisfactory. There are several different design of valves but they would leak, and that is a thing we must guard against. We are equipping the cars with the valves just as fast as we change the tanks.

Chairman Barnum: How long do you think it will take to complete that work?

M. F. Covert: At least three years. That valve cannot be applied to any tank; it also takes a different design of hatchway.

G. F. Laughlin: As to brine tanks, you can appreciate our position when I say we are now testing our fifth device. We experimented with different devices, some outside, and some inside the tanks. We found the valves inside the tanks were prone to close up with accumulations of salt, etc. The tamping of the ice destroyed the mechanism of the valves, and the valves located on the outside are subject to freezing from condensation.

We have in our storeroom 1,600 valves which were purchased for application to our cars, and after some 250 were applied, we found they only ran about 3 per cent. perfect. It is of no use to put in a valve that will not do the work. It is a source of expense to the company that puts it in, and it does not help the railroad company. The valve which is put in must be one which operates readily from the top, and can be understood by any class of labor, positive in its closing, and equally positive in its opening to allow all of the water to flow out. During the winter months the cars return with from 2,000 to 3,000 lbs. of ice in them which it will be necessary to handle in order to apply these valves. You can imagine what that means with a daily receipt of from 150 to 250 cars. We want to put these valves on, but we want to put them on in the right way, and the time allotted is not sufficient.

Chairman Barnum: Our Arbitration committee have extended the time from September 1 to October 1 next year.

G. F. Laughlin: We are thankful for that, but any extension in the winter months does not help us.

I. S. Downing: I believe the Association has recommended practice for taking care of brine. If our recommended practice is not any good it should be thrown out.

Chairman Barnum: The recommendation simply gave general rules, and did not attempt to present anything in the way of a specific device. The private car line representatives are correct in their statement that they have had to work out the details, and I believe that they are also fair in the statements of the difficulties they have met in finding something entirely satisfactory.

E. W. Pratt: We all appreciate the assistance which the private refrigerator car owners gave the committee on refrigerator cars. Without their aid, we would have been a long time in getting results. To further show that appreciation, I make a motion that the date be extended to September 1, 1915, and if the other rule carries, that will be until October 1, 1915.

H. L. Osmond: I want to emphasize Mr. Laughlin's statement, that we can only do this work in the summer. This summer is half gone, practically, and if you extend that time only until September 1, 1915, we have a portion of this year and the summers of 1914 and 1915 in which to do the work. I do not believe we can accomplish it in that time. I am fair in this, and I think the gentlemen should be fair to us, and I offer an amendment that the date be made September 1, 1916.

G. F. Laughlin: That does not mean we will wait until September 1, 1916, before we start on this work, but we do not want to harness ourselves up to a proposition that we cannot pull. The general managers association has expressed a feeling that little or no progress has been made toward controlling the salt water drippings. They are not fully advised, possibly, of the difficulties which we were encountering or they would not have drawn that conclusion. It was at their request that this matter was taken up and the date set for September 1, 1914.

Chairman Barnum: The Arbitration committee felt that could it be, if necessary, deferred next year, before the time arrives,

the same as has been done in similar cases. The time has been advanced, and I think that Mr. Pratt's motion making the time September 1, 1915, should be carried, and the private car lines will not be hurt at all; in the meantime they can make such progress as is possible in the work.

H. L. Osmond: To show my good will, I will withdraw my motion with the understanding that we be given two years from now to show that we have made progress and that having made satisfactory progress, we may make application for a further extension of time.

Mr. Pratt's motion was stated and carried.

Secretary Taylor: The next is rule 94, changing the last sentence to read: "But no bill shall be rendered unless repairs are made, or car withdrawn from service." That is the report of the Arbitration committee.

M. F. Covert: It has been no light capacity car which was returned to us in bad condition, but we have had two cars returned recently with the bodies right down to the floor, and all that was returned to us was the steel underframe. Under this rule, we could get a defect card which the railroads could insist upon giving. If we tore the car down, it would mean that we would have to build it all the way up.

Chairman Barnum: Mr. Hennessey, what was the intention of the Arbitration committee in covering such cases.

J. J. Hennessey: In such a case, it seems to me that if the steel underframe of the car was returned in good condition and it was covered by a defect card, that there was no reason why it should be destroyed, but it should be repaired under the defect card. On the other hand, if the car was beyond repair, then it should be settled for under the rules.

G. F. Laughlin: Under the proposed change, 119 takes the place of that rule. There is no provision for the apportionment under that condition. Does the Committee understand that we must rebuild that car under the same number? In building a car, it is necessary to handle it under "equipment," to put it under a new number.

J. J. Hennessey: I think the private lines would have a first right to build that car and use any number they wish to. If two private lines consolidated, the Master Car Builders could not consistently say that your cars must all maintain the old number; but if I had a car practically worn out and you accepted it home, under a defect card, then you could not. It also provides for joint inspection in those cases.

I. S. Downing: If the private car people wanted to put in a better underframe and a better upper structure, I do not see anything to prevent them putting in a whole new truck or an underframe and billing for the upper structure, as far as the card called for.

G. F. Laughlin: With the new style underframe and new style truck and new number on the truck, we are not returning the same car; then there is an objection to our bill remaining on the defect card. Our light capacity cars could not be operated.

J. L. Hodgson (G. T.): Is it not the general understanding that where a defect card is given and the owner elects to make some changes, he is entitled to bill for the part that the defect card calls for if he reconstructs a car?

J. J. Hennessey: Yes.

F. W. Brazier, (N. Y. C. & H. R. R.): The difference between the value of the car we destroyed and one you wanted to put in, you and I could settle that between ourselves. I would like to ask if you have had any trouble so far with any railroad in such matters?

M. F. Covert: No, sir, we have not.

G. F. Laughlin: The defect card calls for just the items that were destroyed. The point we wanted to bring out was that the railroad company was responsible for that amount of repairs, and if we put that amount of repairs in, we were entitled to bill on the defect card construction; and you could bill on the cash value. We all of us, private car lines as well as railroads, have some light-capacity cars. There is a general sentiment to withdraw these. If we had a car come in with a broken end post or side post and so forth, and if we get that in the shop, we prepare a defect card for all damage and we decide that we shall dismantle that car. It is not a case of the car with a body destroyed. If we elect to tear that down instead of repairing it, we feel we are entitled to the bill on that defect card.

J. J. Tatum (B. & O.): As I understand our friend's question, if a car comes in damaged and he destroys that car, he can build the car by dismantling.

H. T. Bentley (C. & N. W.): Mr. Hennessey made the point clear. If the gentleman wants to tear the car down, he can have a joint inspection, an appraisement, and then bill according to the agreement and on the basis of the M. C. B. rule.

G. F. Laughlin: Can we?

Mr. Bentley: The proposed rules give that.

A. Sternberg (Wabash): No, rule 94. I understand that the gentleman gets a car from the Wabash, and the upper structure of the car is in such condition that they elect to tear it down. If that originally was a 30 ft. car and he makes it into a 34 or a 40 ft. car to bring it up to date, he has no right to claim on that defect card.

J. J. Hennessey: I stated very clearly that you should build as originally constructed—that would not permit the taking of a 30 ft. car and making a 40 ft. car out of it.

T. H. Goodnow: It is a fact that you cannot get a defect card on some cars, and it is up to the point practically where you would naturally condemn the car. The repairs are made, and that class of cars is perpetuated; while on the other hand if it was something you were responsible for, rather than put the $100 or $125 in that car, you would tear the car down and put it in a new car. It seems to me to be possible to reimburse the car owner to some extent for possibly twelve or fourteen months' service which he has lost out of that car; but at the same time it would be a saving to the road which did the damage to have some basis of settlement for the months of service the car owner is out.

E. Chamberlain: Does the gentleman expect this association to extend its paternal authority to the private car owners and to have this rule operated as by a corporation? If that is his logic, in what position would it place this organization? There has been some talk about rebates, and that might work in that category.

T. H. Goodnow: I have made several such settlements as that in the last year. Some roads will do it and some will not.

R. E. Smith (A. C. L.): As I understand the purpose of the defect card, it is to reimburse the car owner for damage. Now, what is the difference between a car coming home for damage done on another road and the same kind of car coming home without that damage, if in both cases the car owner elects to tear it down?

T. H. Goodnow: The car that comes home in that condition is probably a sixty thousand pounds capacity car, seventeen or eighteen years old, and it may have had an old roof replaced; it comes home and some company is kind enough to give you a defect car for all the sills, and you have a car after repairing that you can get eighteen months more service out of.

F. H. Stark: I would like to second the remarks of Mr. Goodnow. At the Pittsburgh Railway Club we discussed that feature and the consensus of opinion was that the car owner should not be reimbursed to the full amount of the damage estimated on the defect card, but that the car owner might be authorized to render a bill for fifty per cent. of the damage. In that case the car owner would no doubt dismantle the car, owing to its light capacity.

Chairman Barnum: Mr. Hennessey, if you, as Chairman of the Arbitration committee would explain the general principle which has been followed in cases of this sort it might clear up this matter.

J. J. Hennessey: It has been a ruling principle, ever since the rules were first inaugurated, that unless the repairs were made a bill should not be rendered. One of our old cars came home, just as one of the speakers said, in such a condition that we were practically going to destroy it. We simply repair it, because part of that damage is covered by a defect card. Are we not perpetuating a class of cars that is not very desirable. You will either repair the car and charge it to the man that damaged it, or destroy it and let it go.

J. J. Tatum (B. & O.): Suppose we start out with this proposition—we have a damaged car and we will settle in accordance with the M. C. B. rules to the extent of that damage. The car may be one of 40,000, 50,000 or 60,000 capacity. The record value of that car may be $200, and the cost to repair may be $300. Is it fair that you would expect any railroad company to give you $300, for a car which you say yourself is only worth $200?

C. E. Fuller (U. P.): I think the discussion illustrates that it is a good thing to keep the old 30,000, 40,000 and 50,000 lbs. capacity cars at home and if you do it, you will not have trouble of this kind. It costs money to tear a car down.

D. R. MacBain: As I view this matter, the railroads have entered into a contract, one with the other, that they would restore any damage occurring, up to the complete destruction of the car, and that is not changed in the proposed change by the Arbitration committee.

As regards any betterment of the old standard, we would have to consider that in an entirely different light, if we want to retire any class of cars we have. I think it is fair that the rule should stand as recommended.

R. L. Kleine (Penna.): I second that motion.

Chairman Barnum: The question is as to whether the rec-

ommendation of the Arbitration committee in regard to rule 94 shall be modified or shall be approved.

The recommendation was adopted.

Secretary Taylor: The next suggestion is in reference to rule 98.

T. W. Demarest: Does not that come in with the report of the committee on Prices?

Secretary Taylor: We have the report of the committee on Prices to cover this afternoon.

T. W. Demarest: This is part of the Price committee's report.

Chairman Barnum: If there is no objection, we will discuss this rule 98 in its order at the present time, and let it apply on the other report. We are talking about the communication from the private car lines. It has been decided to close up this communication completely.

R. L. Kleine: The recommendation of the change in the rule by the Price committee seems advisable that is that we have an average graded price, instead of a second-hand price, and a scrap price for the wheels. It is difficult to determine just what a second-hand, and a scrap wheel is. That is between the man on the repair tracks and the man at the wheel mounting press, and for that reason, the average graded price for each wheel removed was suggested, and I would move you, that the recommendation of the Price committee be adopted.

G. F. Laughlin: In the event of that not being adopted, what would have been the allowance?

J. J. Tatum: The matter has been gone into very thoroughly, and we decided the scrap value of that wheel would have been reduced. In order to avoid that, that in the case of such wheels as were worth while using, that we place a value on the wheel as between the scrap value and the second-hand value.

Chairman Barnum: All in favor of approving the Price committee's recommendation say aye, contrary-minded, no. (The motion was carried).

Secretary Taylor: The next recommendation of the private car lines is Rule 117.

G. F. Laughlin: That is one point that has always affected us. I presume it has affected anyone who has rebuilt to the extent we have. We have torn out cars after spending $400 or $500 on them. If they were damaged or destroyed the next day, there was no consideration given to the extent of the repairs made. In other words, that $500 was lost as far as that company was concerned. On account of the lading the cars carry we cannot allow them to depreciate to the extent shown in the report. We have to rebuild them at frequent intervals and keep them in shape for carrying fresh meat products, and in view of the fact that this rebuilding is necessary we think the depreciation value of 60 should stand as it always has.

J. J. Tatum: The price committee has made recommendations in regard to this depreciation. We feel that the depreciation recommended is a fair one, but the committee does not feel it has convinced the railroad and the private car owners that it is a fair depreciation, for the reason that we have not had an opportunity to study this recommendation carefully; and we feel that full consideration should be given to that portion of the recommendation of the committee in regard to the depreciation.

J. J. Hennessey: I am inclined to feel that as far as refrigerator cars are concerned that the depreciation is too much; and as it has come before this association it says, "Private line cars." Now, refrigerator cars are not the only cars—there are stock cars, coal cars and other cars that are not carrying perishable goods; and it could be arranged with the price committee to keep the depreciation at the old figure on refrigerator cars.

Mr. F. H. Clark (B. & O.): It might be important to consider the recommendations of the Price Committee on the subject of depreciation. We arrived at certain conclusions which are embodied in the report. Our recommendation would be, as far as wooden refrigerator car bodies are concerned, to fix the depreciation at 7 per cent. unless steel sills were built, in which case it would be made 6 per cent. for depreciation. But on the other hand some of our friends say the steel sills are not being built on some of the cars. But I would suggest that a vote be taken upon the recommendation of the Price Committee as to the case of wooden car bodies without steel centre sills; and wooden car bodies with steel centre sills, and depreciation of trucks, we recommend 7 per cent. depreciation. For all metal trucks, a 6 per cent. depreciation.

President Fuller: The past two questions are really Price-Committee questions, and as this last question of depreciation is one which has been covered by the Price Committee. I think it might be well to defer action on that until the other questions are taken up, and then take them all up together.

C. E. Fuller: I move that the report of the arbitration committee be accepted with the exception of the Weighing Rule which is changed. (The motion was carried.)

PRICES FOR LABOR AND MATERIAL.

The committee decided it proper to submit two propositions to be voted upon for Rule No. 98:

First: It is proposed that wheels be settled for, when removed for renewal, on a flat credit rate, in place of having secondhand and scrap prices as heretofore. Flat rate proposed is:

One 36-in. cast-iron wheel.....$5.25
One 33-in. cast-iron wheel..... 4.75

Voting against this proposition will indicate that the present rule will remain without change, except regarding change in price for rolled-steel wheels being reduced from $21 new to $19.50.

Second: It is proposed that cast-steel wheels be settled for when removed for renewal on a flat credit basis, as follows:

One 33-in. cast-steel wheel.....$4.75

A vote against the proposition means that there will be no rate for secondhand or scrap cast-steel wheels.

The committee also recommends that Rule No. 116 be changed as regards to settlement price for all steel freight-car bodies in place of settling as heretofore on a price per car body, that the car body be settled for on a pound basis, using the builder's weight of the car when built new. The price recommended is $0.0325 per pound, and the value of car so placed be subject to yearly depreciation as per Rule No. 117.

Rule 98.—Bills rendered for wheels and axles shall

F. H. CLARK,
Chairman, Committee on Prices for Labor and Material.

be in accordance with the following schedule of prices for material, with the proper debits and credits:

One 36 in. cast-iron wheel	$10.50	$ 7.75	$5.25	$10.50		$5.25
One 33 in. cast-iron wheel	9.00	7.00	4.75	9.00		4.75
One 33 in. cast steel wheel				19.50		4.75
One 33 in. forged or rolled steel wheel	21.00	.....	4.50	19.50	.....	$4.50
One axle 140,000 lbs. (New Item)				25.50	$15.25	9.00
One axle 100,000 lbs.	20.00	12.00	7.50	19.50	11.75	6.75
One axle 80,000 lbs.	16.00	10.00	6.50	16.50	10.00	5.75
One axle 60,000 lbs.	14.00	7.75	5.25	13.00	7.75	4.50
One axle 50,000 lbs. (or under)	10.00	5.00	3.00	10.00	5.00	3.50
And with an additional charge for all labor for each pair of wheels and axles removed from all types of trucks				2.25	.....	
Removing, turning and replacing a pair of forged or rolled steel or steel tired wheels for all types of trucks				3.25	.....	

Rule 101.—The committee suggests that item for labor in this rule be changed from 24 cents per hour to 28 cents per hour. If the recommendation of committee in regard to this change is not accepted, the report should be returned for revision, for the reason that all prices in Rule No. 107 have been arranged on the 28-cent hourly basis. On account of the increased labor rate providing for overhead charges and use of facilities, the committee would recommend the elimination of the ten per cent. additional charge to net total of bills authorized last year.

The following changes are recommended by the committee: Under repairs of steel or steel parts or composite cars;

change "All rivets ½-in. diameter or over, 12 cents net per rivet, which covers, etc.," to read "All rivets ½-in. diameter or over, 14 cents net per rivet, which covers, etc."

Change—"All ¼-in. rivets and less than ½-in. diameter, 7 cents net per rivet, etc.," to read: "All rivets ¼-in. diameter and less than ½-in. diameter, 8 cents net per rivet, etc."

Change—"Straightening or repairing parts in place on damaged cars, also any part that requires straightening, repairing or renewing, not included on rivet basis, 24 cents per hour," to "Straightening or repairing parts in place on damaged cars, also any part that requires straightening, repairing or renewing, not included on rivet basis, 28 cents per hour."

NEW ITEMS.

REPAIRS TO STEEL TANKS OF TANK CARS.

Labor for repairing and testing, per hour	$0.40
Steaming, per tank	0.75
Water for testing, per 1,000 gallons	0.06

In making repairs to cars on a rivet basis the cost of removing and replacing fixtures not secured by rivet but necessarily removed in order to repair or renew adjacent defective parts, should be in addition to the rivet basis, rules covering wood car repairs to govern.

Rule 109.—The committee suggested that this rule be changed to read: "When it is necessary to apply any M. C. B. coupler complete, on account of a broken or missing knuckle or lock, the usual labor charge for replacing a coupler can be made.

"When one or more carrier iron bolts over 6 in. long are replaced and pocket coupler at same end of car is removed and replaced, the regular charge for applying carrier iron bolts should be reduced one-fourth hour for each bolt."

Rule 116.—The settlement prices of new eight-wheel cars shall be as follows, with an addition of $27.50 for each car equipped with 8-in. air-brake equipment and $35.00 for 10-in. air-brake equipment. The road destroying a car with air brakes may elect to return the air-brake apparatus, including such attachments as are usually furnished by the air-brake manufacturers, complete and in good condition. The following new items have been added:

Self-clearing hopper, 30 tons, but not less than 40 tons	$295.00
Self-Clearing hopper, 40 tons, but not less than 50 tons	315.00
Self-clearing hopper, 50 tons capacity and over	400.00

The lengths of the cars above mentioned refer to lengths over the end sills. In the case of double-deck stock cars, $25 may be added to the prices given above for stock cars.

The paragraph reading: "Where the capacity of any car other than gondola is 60,000 lbs. or over, 10 per cent. should be added to the above prices for the car bodies" should be eliminated.

Change paragraph reading: "When cars of 60,000 lbs. capacity or over, and so stenciled, have trucks with journals 4 in. or over, etc.," to read: "When cars of 60,000 lbs. capacity or over, and so stenciled, have trucks with journals 4¼-in. or over, etc."

Change the last two lines of the paragraph reading: "When cars are equipped with metal center sills, the following prices shall be added to the values of bodies for cost of such metal sills:

10 in. or less	$60
Over 10 in.	80"

To read:

10 in. or more	$80
Less than 10 in.	60

The committee also recommends that Rule 116 be changed in regard to the settlement price for all-steel freight car bodies, and in place of settling as heretofore on a price per car body, that the car body be settled for on a pound basis, using the builder's weight of the car when new. The price recommended is $0.0325 per lb., and the value of car so fixed subject to yearly depreciation, as per Rule No. 117.

To the prices for box or stock cars with metal underframe and steel framed composite superstructure, add $50 if built with sheathing boards on outside, or $100 if built with sheathing boards on inside only.

Trucks.	Present Prices.	Proposed Prices
80,000 lbs. capacity, but under 100,000 lbs., all metal, per pair, but under 140,000 lbs.	$400.00	$350.00
100,000 lbs. capacity or over, but under 140,000 lbs., all metal per pair	425.00	375.00
140,000 lbs. capacity or over, all metal, per pair		600.00

Prices include brake beam complete, truck levers, dead lever guides and bottom connection rods. For trucks with steel or steel-tired wheels, an additional allowance of $112 per car shall be made. All trucks in service of 60,000 lbs. capacity or over, which consist entirely of metal with the exception of the spring plank, shall be known hereafter as all-metal trucks.

The following changes in depreciation rates were proposed:

In the case of wooden car bodies the depreciation due to age shall be figured at 7 per cent. per annum upon the yearly depreciated value.

In the case of wooden car bodies with steel center sills the depreciation due to age shall be figured at 6 per cent. per annum upon the yearly depreciated value.

In case of all steel car bodies the depreciation shall be figured at 5 per cent. per annum upon the yearly depreciated value.

The depreciation on the tanks or tank cars for handling non-corrosive substances shall be 4 per cent. per annum. For tanks of tank cars handling corrosive substances, the depreciation shall be 5 per cent. per annum upon the yearly depreciated value.

The depreciation of trucks other than all metal shall be figured at 7 per cent. per annum upon the yearly depreciated value.

The depreciation on all metal trucks shall be figured at 5 per cent. per annum upon the yearly depreciated value.

The allowance for depreciation on wooden car bodies shall in no case exceed 80 per cent. of the value when new. The allowance for depreciation on steel underframe or all steel car bodies shall in no case exceed 60 per cent. of the value when new. The allowance for depreciation on trucks other than all metal shall in no case exceed 70 per cent. of the value when new. The allowance for depreciation on all metal trucks shall in no case exceed 60 per cent. of the value when new. The allowance for depreciation of wooden car bodies with steel center sills shall in no case exceed 70 per cent. of the value when new.

PASSENGER EQUIPMENT.

Rule 7.—Change to read: "No labor charge shall be made for applying brake shoes, incandescent bulbs, gas domes, gas globes, gas bulbs, gas bowls, gas pillars, journal bearings, hose (air, steam or signal), mantles, tips, filling lamps, charging batteries, gasing tanks, icing or coaling cars."

The report is signed by:—F. H. Clark (B. & O.), chairman; G. E. Carson (N. Y. C. & H. R.); Ira Everett (L. V.); J. F. Dunn (O. S. L.); S. T. Park; H. E. Passmore (T. & O. C.), and C. F. Thiele (P. C. C. & St. L.).

F. H. Clark read the following after presenting the report: I would like to include in the report of the Committee a communication from the General Secretary of the American Railway Association as follows:

"At the session of the American Railway Ass'n held on May 21, the following resolution was adopted:

'Resolved, that in view of the increase in the per diem rate and the cost of cleaning and switching freight cars, this Association recommends to the Master Car Builders' Association that the charge for re-weighing and re-marking foreign freight cars should not be less than $1 for other than stock cars and not less than $1.25 for stock cars.'"

That we want to include as a change in Rule 107. The present corresponding prices being 75c to $1, we propose to increase them to $1 and $1.25.

DISCUSSION.

A motion was adopted to accept the report with the exception of the recommendations as to depreciation which is to remain the same as last year; and to incorporate it in the rules of interchange.

FREIGHT CAR REPAIR BILLS.

The committee appointed to confer with the subcommittee of the Association of American Railway Accounting Officers regarding freight car repair bills, recommends that the following rules of that association be observed when rendering or correcting bills:

A. Bills should not be rendered for amounts less than 25 cents in aggregate, but charges for items less than 25 cents may be held until they amount to that sum, provided the aggregate is rendered within 60 days.

B. No bills should be returned for correction on account of incorrect car numbers, but shall be passed for payment at once and the alleged errors in car numbers brought to the attention of the company rendering same within 60 days from date of receipt of bill.

The billing company shall furnish correct car reference, or shall issue within 30 days counter charge authority, as per Form 1 attached.

C. No bills shall be returned for correction on account of other error or questionable charges unless the net amount involved exceeds 10 per cent. of the total amount of the bill, but shall be passed for payment at once and the alleged error brought to the attention of the billing company within 60 days from the date of receipt of the bill. The billing road must

furnish proper explanation or shall issue, within 30 days, counter charge authority on Form 1.

D. Undercharges shall be similarly adjusted on regular authority of the company against which the bill has been rendered.

E. When bills are returned for correction, all defect cards and billing repair cards, except those in question, must be retained by the company against which the bill has been rendered.

FORM 1.

M. C. B. ASSOCIATION—COUNTERBILLING AUTHORITY.

(NAME OF RAILROAD)

Place.....191..

This will Authorize the.....Railroad Company to counterbill the.....Railroad Company. ..... Dollars to offset overcharge in our bill No....Amount, $..... $..... .....

This authority must be attached to bill. Signature of person issuing.

This report is signed by:—D. F. Crawford (Penna. Lines), chairman; C. E. Fuller (U. P.), and M. K. Barnum.

This report was adopted.

ABUSE OF THE REPAIR CARD.

A committee, representing the Association of American Railway Accounting Officers and Master Car Builders' Association, met at the LaSalle Hotel, Chicago, April 8, 1913, to consider the subject, particularly as to alleged irregularities practiced by some railroads in rendering bills for repairs to cars. A letter from F. A. Delano, receiver of the Wabash, was read carefully, and his suggestions were given due consideration. It was the unanimous opinion of the joint committee that the handling company should not be expected to assume the expense in connection with the application of M. C. B. knuckles, air hose, brasses, etc., as the committee felt that this plan would not furnish the desired relief, but on the other hand would place a burden on those railroads which aim to keep their cars in first-class condition for service by imposing additional expense of partially maintaining the cars of other railroads who do not maintain their own cars in a serviceable condition.

It is believed that in some instances the price for labor and material established by the Master Car Builders' Association are less than cost, if supervision, the use of facilities and tools and other shop expenses are taken into consideration. This has a tendency to cause some car owners to encourage the making of repairs to cars by the handling company. Therefore it is suggested that the Master Car Builders' Association make such changes in the allowances for labor and material as will more nearly represent the actual cost of repairs. To enable the car owners to make a check of the car repair bills on the basis of car days, it is recommended that Rule 93 be changed to read as follows:

"Separate bills must be rendered for cars destroyed."

All charges for repairs made to cars account of owners' defects, defect cards and rebuttal authorities must be consolidated against any one company into one bill.

Separate statements to be made: First, For owners' defects for each calendar month; second, For all charges based on defect cards, including rebuttal charges.

NOTE.—Totals only of these statements to be shown on the recapitulation.

If the above rule, as amended, is complied with, it will, it is believed, enable a car owner to readily ascertain from time to time the exact amount charged his company for car repairs per car day on any line in any given period. The joint committee is of the opinion that no practical method can be devised to check car repair bills, by which dishonest practices can be positively detected, and, further, is unwilling to believe that dishonest methods are being employed, excepting in isolated cases.

It is the opinion of the joint committee that the interchange rules of the Master Car Builders' Association as now formulated, if honestly followed, are perfectly fair and equitable to all car owners, and it is further believed that the enforcing of honest methods in connection with repairing of cars and making repair bills is something which is to a very large extent under the control of the ranking officials of each company. The recommendation of the joint committee therefore is that the officer in charge of the mechanical department of each railroad and company look into the practice of making repairs to foreign cars and rendering bills for such cars repaired on his own line, with a view of seeing that the work is honestly performed, and also that the bills are rendered only for defects for which the car owner is responsible.

The committee approves the foregoing report and recommendations of the joint committee, and recommends that rule 93 be changed in accordance therewith at this convention, and recommends further that the attention of all members be again called to the resolution passed in 1909, with the request that where any evidence of improper use of the repair card is available that it be submitted to the executive committee for appropriate action.

The report is signed by:—D. F. Crawford, (Penna. Lines), chairman, C. E. Fuller, (U. P.), and M. K. Barnum.

Discussion was deferred to a later session.

MASTER CAR BUILDERS' REGISTRATION.

Acker, C. B., Car Foreman, Pittsburg, Shawmut & Northern, Monticello.
Acker, Chas. L., M. M., Toledo Terminal, Lexington.
Barba, C. E., Asst. Engineer, Penna., Haddon Hall.
Barrett, C. D., Asst. Engineer M. P., Penna., Chalfonte.
Barrett, R. W., M. C. B., N. & S., Lexington.
Blair, H. A., Gen'l Car Inspt., Balt. & Ohio, Lexington.
Borrowdale, J. M., Supt. Car Dept., Ill. Central R. R. Brighton.
Bossworth, W. M., M. Engineer, Kansas City Southern, Raleigh.
Bottomly, Ed. S., Chief Joint Car Insp., C. V. and B. & O., P. & J., Lexington.
Boyden, N. N., M. M., Southern, Shelburne.
Boyer, Chas. E., Gen'l Car Insp., Penna. R. R., Runnymeade.
Bundy, C. L., Gen'l For., D. L. & W., Haddon Hall.
Burch, J. J., District Car Inspt., Norfolk & Western, Shelburne.
Burns, T. J., Asst. Supt. M. P., Mich. Central R. R., Traymore.
Carmer, J. R., Gen'l. Foreman, Phila. Balt. & Wash., Haddon Hall.
Carr, W. K., General Car Inspt., N. & W., Traymore.
Carson, G. E., District Manager Car Builder, N. Y. C. & H. R., Traymore.
Case, S. T., M. C. B., N. Y. C. & H. R., Pennhurst.
Caton, S. W., Gen'l Car Insp., Western Maryland R. R., Monticello.
Combs, S. W., M. C. B., Cuba, Traymore.
Combs, W. B., M. M., Macon, Dublin & Savannah R. DeVille.
Cooper, F. R., S. M. P., Kansas City Southern, Arlington.
Courson, J. F., Gen'l Foreman Wall Shop, Penna., Brighton.
Corinth, A. B., Gen'l Inspr., Atlantic Coast Line, Lafayette.
Craig, A., General Foreman, Boston & Maine R. R., Dunlop.
Craig, James, Chief Draughtsman, Boston & Maine, Dunlop.
Damerest, T. W., Supt. M. P., Penna., Brighton.
Deibert, John H., Foreman Car Reprs., L. V. Ry., Boswell.
Deyot, Frank, Asst. Gen. Foreman, N. Y. C. & H. R., Pennhurst.
Dickinson, F. W., M. C. B., B. & L. E. R. R., Lexington.
Donohue, Thos., Dir. Gen. Car For., N. Y. C. & H. R., Lexington.
Dow, Geo. N., Gen. Mech. Insp., N. Y. C. Lines.
Downing, I. S., M. C. B., L. S. & M S, Traymore
Eberle, Wm. F., Gen. For., Penna., Chalfonte.
Elliott, B. F., M. C. B., Havana Central, Traymore.
Everett, Ira, Asst. Shop Supt., L. V. Ry.
Friese, N. L., Gen. For, N. & W., Marlborough-Blenheim.
Fritts, J. C., M. C. B., D., L. & W. R. R., Traymore.
Fryer, C., Gen. For. Car. Dept., N. Y., O. & W. R. R., Traymore.
Gray, G. M., Supt. M. P., B. & L. E., Marlborough-Blenheim.
Grove, P. L., Asst. Engr. M. P., P. R. R., Chalfonte.
Haig, M. H., M., Topeka & St. Fe, Traymore.
Hall, W. H., Chief Car Insp., C. R. R. of N. J., Monticello.
Hartman, F. B., Gen. Equip. Insp., Southern, Arlington.
Hayes, A. C., Gen. Car For., N. Y. C. Lines, Pennhurst.
Hendry, John, M. C. B., Grand Trunk Ry. System, Traymore.
Henry, J. M., M. M., Penna., Chalfonte.
Hodgson, J. L., M. C. B., Grand Trunk Ry., Traymore.
Irvin, T. B., M. M., C. & W. C. Ry., Lexington.
Jackson, O. S., Supt. M. P., C. T. H. & S., Dennis.
Jansen, E. W., Elec Engr., Ill. Cen. R. R., Dennis.
Johnson, J. O., Foreman Car Repairs, Southern Ry., Arlington.
Keagy, C. O., Genl. Foreman, P. R. R., Haddon Hall.
Kimmett, M. A., Genl. Foreman Car Dept., C. R. R. of N. J., Lexington.
Kipp, A., Genl. Car Inspt., N. Y., Ont. & W., Traymore.
Knox, W. J., M. Engineer, B., R. & P., Brighton.
McConville, H. A., Insp. F. C. R., L. & N., Lexington.
McCully, B. N., Foreman Car Dept., N. Y., P. & N., Haddon Hall.

McKinsey, C. R., Genl. Car Inspt., P., B. & W., Runnymede.
Marden, J. W., Supt. Car Dept. (Retired), B. & M., Chalfonte.
Mercur, R. E., Traffic Manager, Traymore.
Michael, J. B., Master Mechanic, So. Ry., Shelburne.
Millar, E. T., Genl. Car Inspector, B. & M. R. R., Chalfonte.
Miller, E. B., Genl. Car Insp., B. & O. R. R., Lexington.
Miller, R. S., M. C. B., N. Y. C. & St. L., Traymore.
Milton, J. H., Supt. Car Dept., C., R. I. & P. Ry., Lexington.
Morse, C. S., M. C. B., W. & L. E., Brighton.
O'Brien, W. J., M. M., Kanawha & Michigan.
O'Donnell, T. J., Arbitrator, N. Y. C. Car Shops, Pennhurst.
Orchard, J. H., Foreman Car Dept., D. & H., Bothwell.
Osman, H. L., Supt. Car Dept., Morris & Co. Refr. Lines, Traymore.
Ott, W. B., Asst. Engr. M. P., P. R. R., Chalfonte.
Painter, J. H., Shop Supt., A. C. L., Chalfonte.
Peiffer, Charles E., Genl. Car Inspt., B. R. & P., Brighton.
Perine, D. M., Supt. Motive Power, Penna., Traymore.
Quinn, C. H., Asst. Engr. M. P., N. & W., Dennis.
Rasbridge, R. B., Chief Car Inspector, P. & R., Dennis.
Rockfellow, W. E., General Car Foreman, N. Y. C. & H. R. R. R., Pennhurst.
Rommel, Geo., M. M., Phila. & Reading.
Schmidt, E. C.,Haddon Hall.
Schwartz, C. L.,Asst. General Manager, Dunlop.
Schrader, J. R., General Foreman, N. Y. C. & H. R. R. R., Pennhurst.
Shackford, J. M., Chief Draftsman, Del., Lackawanna & Western R. R., Marlborough-Blenheim.
Shearer, R. D., Asst. General Div. Car Foreman, N. Y. C. & H. R. R. R., Lexington.
Small, J. W., Supt. M. P., Seaboard Air Line Ry.
Smith, Abram E., Asst. M. C. B., Union Tank Line, Shelburne.
Smith, B. T., General Foreman, West Jersey & Seashore, Schlitz.
Smith, H. J., General Car Inspector, Del., Lackawanna & Western R. R., Monticello.
Stark, F. H., Supt. R. S., Montour R. R., Chalfonte.
Sternberg, Adam S., General Inspector Car Dept., Wabash, Haddon Hall.
Stow, Fred. T., Asst. Supt., Delray Connecting R. R., Lexington.
Sumner, E., M. M., Northern Central, Chalfonte.
Tatum, John J., Supt. Freight Car Dept., B. & O., Chelsea.
Thiele, Chas. F., General Car Inspector. P. C. C. & St. L., Pennhurst.
Thompson, W. O., Master Car Builder, N. Y. C. & H. R. R. R., Marlborough-Blenheim.
Totten, E. C., Dist. General Car Foreman, N. Y. C. & H. R. R. R., Pennhurst.
Brimer, Geo. Van, Supt., Colo. & Wyoming, Haddon Hall.
Vittum, J. E., Chief Joint Inspector, Columbus Rys., Arlington.
Walsh, J. F., C. & O., Traymore.
Westervelt, Jos., M. C. B., N. Y. C. & H. R., Lexington.
Wilson, R. D., Asst. Chief Car Inspt., Phila. & Reading, Monticello.
Yergy, J. P., General Car Inspt., Penna., Dennis.

MASTER MECHANICS' REGISTRATION.

Barrett, C. D., Asst. Engr. M. P., Penna. Chalfonte.
Beamer, James A., M. M., Penna., Chalfonte.
Caracristi, V. Z., C. E., D. & H. Co., Marlborough-Blenheim.
Combs, W. B., M. M., Dublin & Savannah R. R., DeVille.
Demarest, T. W., Supt. M. P., Penna. Lines, Brighton.
Ferguson, L. B., M. M., V. S. & P. Ry., Monticello.
Gallaway, W. S., M. M., B. & O.
Gray, Guy M., Supt. M. P., B. & L. E., Marlborough-Blenheim.
Henry, J. M., M. M., Penna., Chalfonte.
Hildreth, F. F., M. E., Vandalia R. R., Dennis.
Jackson, O. S., Supt. M. P., C., T. H. & S. E. Ry., Dennis.
McGuire, J. J., Gen. For., B. & O., Lexington.
Mechling, J. E., M. M., Vandalia R. R., Haddon Hall.
Meister, C. L., M. E., Atl. Coast Line, Dennis.
Orghidan, Const., M. I., Roumanian Govt., Chelsea.
Osborne, Harry O., M. M., C. R. I. & P., Haddon Hall.
Small, J. W., Supt. M. P., Seaboard Air Line Ry.
Sumner, Eliot, M. M., Northern Central, Chalfonte.
Thompson, W. O., M. C. B., N. Y. C. & H. R. R. R., Marlborough-Blenheim.

M. C. B. GUESTS.

Adams, J. W., Gen. For. M. Dept., B. & O., Monticello.
Ainscough, H., Gen'l Foreman, B. & O. R. R., Spiedel.
Akers, M. E., Car Foreman, B. & O., Lexington.
Anderson, J. W., General Car Inspt., S. A. L.
Andrus, C. H., M. M., Penna., Jackson.
Axtell, C. D., Gen. For. Elec. Dept., D. L. W., Dennis.
Baker, Horace, Gen'l Manager, Q. & C. Route, Marlborough-Blenheim.
Baker, Robt., Son of Gen'l Manager, Q. & C. Route, Marlborough-Blenheim.
Barwis, J. McC., Gen'l For. Pass. Car Inst., Penna., La Belle Inn.
Baumbush, A. J., Gen. For., N. Y. C. & H. R. R., N. Y. H. H. & H. R. R., Pennhurst.
Beyer, O. S., R. I., Chalfonte.
Bigelow, E. F., For. Painter, N. Y. C. & H. R., Dunlop.
Bixby, O. M., Chief Draftsman Electrical Dept., N. Y. C. & H. R., Lexington.
Bofell, Elmer A., Head Car Draughtsman, P. & R., Albemarle.
Boker, Wm. S., Chief Clerk to G. M., N. Y. C. & H. R., Haddon Hall.
Bromley, Joseph, Inspector, Inter-State Commerce Com.
Brubaker, H. H., M. P. Clerk, Penna., Chalfonte.
Bugg, B. L., Asst. General Manager, A. B. & A., Marlborough-Blenheim.
Burr, H. S., Supt. of Stores, Erie, Dennis.
Burton, G. H., Asst. M. M., W. J. & S., Chalfonte.
Butler, L. W., G. F. C. D., Seaboard, Marlborough-Blenheim.
Campbell, J., Inspt. Test Dept., Southern, Chalfonte.
Caracristi, V. Z., Chief Eng., D. & H. R. R. Co., Marlborough-Blenheim.
Carter, B. D., Car Foreman, Virginia, Kentucky.
Carty, F. J., N. E., B. & O., St. Charles.
Casey, J. T., Foreman, P. R. R., Wittle.
Courson, C. L., Foreman Car Inspt., Penna., Planters.
Coyle, C. H., German American Car Co., Haddon Hall.
Craig, John D., Inspector, B. & M., Dunlop.
Davis, W. H., M. E., N. Y. O. & W., Chalfonte.
Day, M. R., Gang For., B. & O., Beauvier.
Dette, R. E., For. Mach. Shops, Penna., Blythe Cottage.
Donahue, C. M., M. P. Clerk, Penna., Chalfonte
Donlin, W. M., Asst. Treas., P. & L. E., Traymore.
Donoghue, C. H., For. Car Dept., N. Y. C., Arlington.
Ferree, H. W., Gen. For. Car Shops, P. & L. E., Pennhurst.
Fosnor, G. N., C. C. M. M., Cumb. Valley, Chalfonte.
Frazer, Wm. H., Pur. Agts. Dept., Penna.
Garratt, L. W., C. C. to Supt. M. P., P. & L. E., Pennhurst.
Garrity, J. W., Jr., Insp., Penna, Chalfonte.
Jellison, B. T., Pur. Agt., C. & O., Chalfonte.
Jones, J. W., Asst. C. C. to P. A., B. & O.
Kimmett, A. D., M. M., Lack. & Wyoming, Lexington.
Kern, Wm., Foreman M. P. Dept., B. & O., Strand.
Kidd, C. M., Gen. Air Brake Ins., Norfolk & Western, Shelburne.
Lee, F. H., Gen. Car For., B. & O., Lexington.
Lichtenfels, Philip H., For. Car Repairs, Penna. R. R., New Ocean Hall.
Lovell, D. H., Supt., Penna., Haddon Hall.
McGary, A., Chief Electrician, N. Y. C. & H. R., Rudolf.
Mallam, G. L., Foreman, Penna. R. R.
Mercer, J., Blacksmith, B. & O., Ebbett.
Mervine, J. B., Clerk M. P. Dept., Penna., Traymore.
Miller, H. L., Car Foreman, B. & O., Lexington.
McLaren, W., Asst. Supt., Pullman Co., Shelburne.
Maddox, C. W., Chief Car Inspt., C. & O., Chalfonte.
Monan, Wm., Gen. Foreman, B. & S. Ry., Pennhurst.
Noble, H. S., Asst. Road Foreman of Engs., Penna., Chalfonte.
O'Brien, Vollard, Kanawha & Mich.
Pendleton, Edw., Chief Interchange Inspt., Peoria & Pekin Terminals.
Rogers, Herbert, Mech. Eng., T. & N. O.
Shone, W. B., Insp. Car Dept., N. Y. C. & H. R., Lexington.
Snyder, J. F., Chief Clerk to V. P., N. & W., Marlborough-Blenheim.
Stewart, W. T., Vice-Pres. & Gen. Mgr., Gulf & Ship Island, Haddon Hall.
Train, A. H., Special Insp., N. Y. C. & H. R., Pennhurst.
Townsend, J. F., Traffic Mgr., Lake Terminal R. R., 429, St. Charles.
Thompson, Harry, N. Y. C. & H. R. R., Marlborough-Blenheim.
Wadsworth, Geo. P., Haddon Hall.
Warren, H. M., Elect. Eng., D. L. & W., St. Charles.
Weldon, A. T., Inspt., W. J. & Seashore.
White, Frank B., Foreman Phila. Terminal Div., E. & W. Penn. Div., Elberon.
Wigstman, F. A., Special Apprentice S. M. P. Dept., Penna., Dennis.
Williamson, C. H., Draftsman, Penna. R. R., Seaside.

Conventionalities.

John F. Snyder, chief clerk to the vice-president of the Norfolk & Western, came in on Sunday morning.

A. B. Lacy, purchasing agent of the Virginian railway, accompanied by Mrs. Lacy, who is visiting the conventions for the first time, are stopping at Haddon Hall.

William G. Phelps, assistant purchasing agent of the Pennsylvania Lines west of Pittsburgh, is making his first visit to the conventions.

N. D. Maher, vice-president in charge of operation on the Norfolk & Western, arrived Friday evening, and spent Saturday and Sunday in Atlantic City.

Mrs. Walter E. Coffin came from Cleveland to join Mr. Coffin in Atlantic City Sunday night. She will spend several weeks in visiting relatives in Pennsylvania before returning home.

Grant W. Spear, vice-president of the Dearborn Chemical Company, accompanied by Mrs. Spear and their daughter, Miss Emily Spear, will sail July 1 for a visit of three months in Europe.

Thomas J. Burns, master car builder of the Michigan Central, arrived yesterday afternoon and is stopping at the Traymore. This is his first trip to Atlantic City. He is accompanied by Mrs. Burns.

H. B. Henry, Assistant to Director of Purchases, Southern Pacific.

H. C. Van Buskirk, formerly superintendent motive power of the Colorado & Southern, is missed by his friends this year. He is now basking in the sunshine at Oceanside, Cal., and is reported to have fully recovered his health.

Arthur Hale, general agent of the American Railway Association, and chairman of the committee on Relations between Railroads, was a visitor yesterday and was especially interested in the report on Car Interchange Rules. He was at the Dennis.

John McKinnon, president of the Kalamazoo Railway Supply Company, and an honorary director and ex-president of the National Railway Appliances Association, has been an interested visitor to the conventions this week. He is stopping at the Wiltshire.

T. F. Barton, master mechanic of the Lackawanna at Kingsland, N. J., who is attending the convention, has in his charge some of the new fast freight Pacific type locomotives which are being used in manifest service on that road. Another interesting feature on his division is the use of brick arches in the hard coal burning Pacific type locomotives.

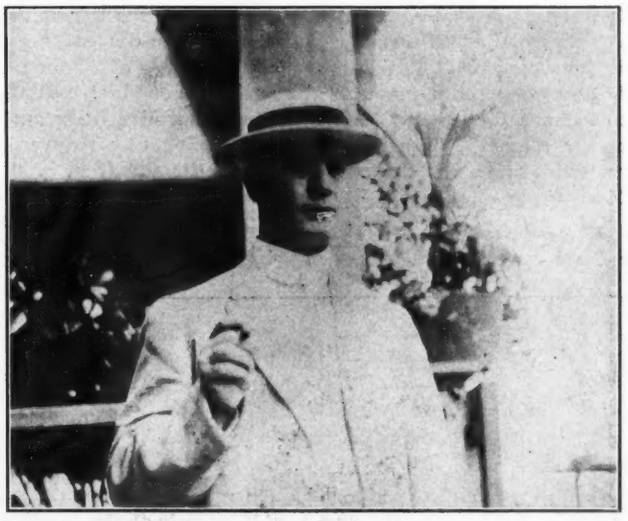
Rodney Evans, who retired several years ago as purchasing agent of the Pittsburgh & Lake Erie, has been quite ill during the past year and came to Atlantic City several weeks ago to benefit from the change in air. He is stopping at the Chalfonte.

B. B. Milner, assistant master mechanic of the P., B. & W. at Wilmington, Del., says that the division with which he is connected had a lively time during the week of the inauguration. In spite of the heavy pressure under which it was working everything went off in fine shape.

J. S. Stringham, Capt. Charles Gifford and Neil MacDonald, of the Monarch Steel Castings Company, are quartered at the Marlborough-Blenheim. The ferocious looking lion in their exhibit is not a real, live lion, though it looks the part and though it has frightened small children.

S. K. Dickerson, superintendent of motive power of the Big Four, had some interesting experiences in the recent flood. Several of the engine houses were badly flooded but in all cases, except for a few unimportant locomotives, the power was placed so that the flood could not injure it.

J. T. Carroll, assistant general superintendent of motive power of the Baltimore & Ohio, and Mrs. Carroll, are at the Marlborough-Blenheim. They are accompanied this year by little golden-haired Virginia Carroll and Master Carroll. The little ones are great favorites among the guests at the hotel.



L. A. Richardson, Mechanical Superintendent, Rock Island Lines.

E. Beyer, brother of O. S. Beyer, Jr., of the Rock Island Lines, spent two or three days looking over the exhibits and seeing Atlantic City. He is in steamship service and had some interesting stories to tell of conditions in the ports of Mexico at which his steamer stopped and of the refugees that they brought away with them.

F. H. Stark, superintendent of the Montour Railroad, will soon be an officer of a real railroad. The Montour is now being extended so as to connect with all the railroads entering Pittsburgh, and when it does it will be the only railroad which can boast of this accomplishment. Over 1000 men are now employed on the construction work. The railroad will be operated entirely independently of the Pittsburgh Coal Company, of which it has always been a part.

In discussing the untimely end of Andrew S. Crozier, of the American Steel Foundries, Bert Waycott and Harry Frost, two old timers, remarked that insofar as they could recall, the death of Mr. Crozier was the first, at least in more than 20 years, to have occurred at one of these meetings. In a way this is remarkable. There are several thousands of us; and what with the

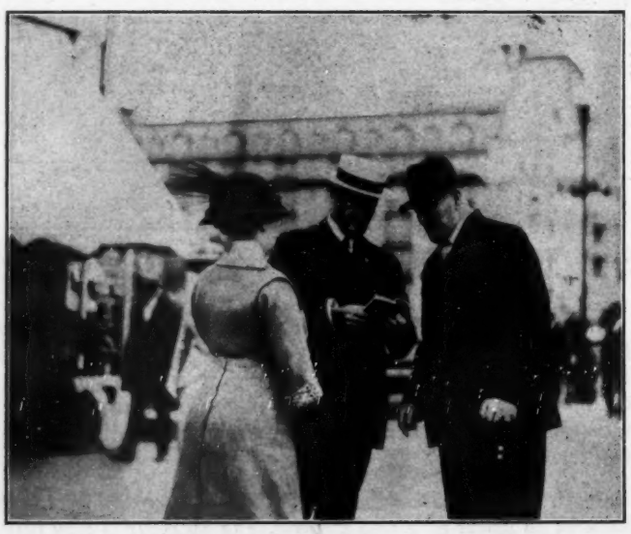
chances for accident on one hand, and the danger of unusual and unseasonable viands on the other, an occasional death would not have been contrary to the law of average.

W. J. Press, mechanical engineer, National Transcontinental of Canada, is a visitor at the conventions. The National Transcontinental is the portion of the Grand Trunk Pacific between Winnipeg and the Atlantic Coast, which is being constructed by the Canadian government, and Mr. Press has charge of the shop, engine house and other mechanical matters over the entire distance. A part of the Winnipeg end of the line has been in operation by the company for some time and it is expected that additional sections will be turned over for operation during the year.

Among the convention visitors who arrived on Sunday is Samuel T. Fulton, vice-president of the Railway Steel Spring Company, a man who has left the railway service and risen rapidly in the supply business. Mr. Fulton was for several years assistant to President B. L. Winchell, of the Rock Island. At the time of the separation of the Rock Island and Frisco he became connected with the Railway Steel Spring Company as western manager, and on March 1, 1912, was made general sales agent at New York, from which position he has just been promoted to vice-president. He is staying at the Strand.

Robert P. Lamont, president of the American Steel Foundries, attended the conventions most of last week. He attended the M. M. meetings and made a careful examination of the exhibits. In leaving for New York Mr. Lamont expressed the opinion that in points of interest and educational benefit the convention and exhibits surpassed the record over all previous years. George E. Scott, vice-president of the American Steel Foundries, motored to Atlantic City from Chicago. Rumor says all existing automobile records between Chicago and Atlantic City received a shattering when Mr. Scott stopped his machine in front of the Marlborough-Blenheim.

Mr. and Mrs. W. A. Blanchard are, as usual, at the conventions and are stopping at the Marlborough-Blenheim. Mr. Blanchard



Left to right—Mrs. C. H. Terrell, C. H. Terrell, Assistant Superintendent of Motive Power, Chesapeake & Ohio, and T. Kilcoin, Foreman Boilermaker, A. C. & I.

spoke enthusiastically about the exhibits and contrasted the present splendid display, occupying some 90,000 square feet, with the showing made by the supply men some twenty years ago when most of the manufacturers were accustomed to take their exhibits with them to the conventions. Mr. Blanchard, for the American Steel Castings Company, exhibited for the first time at Old Point Comfort a locomotive frame. It was the heaviest exhibit ever taken to the conventions, and Mr. Blanchard had considerable difficulty in installing it. The negro helpers were afraid the casting would fall on them and absolutely refused to touch it. It was then that some of the master car builders and master mechanics came to Mr. Blanchard's assistance, took off their coats and in a short time the exhibit was in its proper place.

Among the special guests of the M. M. and M. C. B. Associations attending the convention is Dwight C. Morgan, vice-president and general manager of the Pittsburg & Shawmut. As chief engineer of the Minnesota Railroad Commission Mr. Morgan a few years ago made the valuation of the Minnesota railways which was so conspicuously involved in the Minnesota rate case decided last week by the Supreme Court of the United

C. H. Kenzel, Purchasing Agent, Elgin, Joliet & Eastern.

States. Mr. Morgan's attitude in that case has commanded respect in all quarters as being eminently fair throughout as he declined to accept the theories either of the commission or of the railways alone but was guided entirely by his ideas of justice to both sides. Since completing the valuation work for that commission four years ago Mr. Morgan has been working 16 hours a day developing and rehabilitating the property of the Pittsburg & Shawmut and the Pittsburg, Shawmut & Northern, the underlying securities of which are owned by the P. & S. This has included the building of about 100 miles of extensions, now completed with the exception of 17 miles. The property serves a rapidly developing bituminous coal region and the roads will this year handle from 3½ to 4 million tons of coal. Mr. Morgan is accompanied by Mrs. Morgan.

Among the arrivals Sunday morning were Sam Lynn, master car builder, and Harry W. Ferree, general foreman of the car department of the Pittsburgh & Lake Erie. A considerable amount of equipment has been added to the steel car shop at McKees Rocks, Pa., during the year, including a new flange press, three punches and a shear. Just now the old 50,000 lb. capacity steel cars are being rebuilt at the rate of eight a month. This rebuilding includes the application of new floor and hopper sheets, and in some cases the reinforcement of the center sills. It is expected that the old side sheets will wear as long, if not longer, than the new floor sheets. During the summer the building for steel car work will be extended, practically doubling its capacity. When the shop was first put in operation several years ago only a small part of it was required for steel car repairs, but the increased number of these cars in use and the fact that the older cars are now needing heavy repairs have not only made it necessary to do the heavy repairs on the wooden equipment elsewhere, but have required the above mentioned increase in capacity. Heavy repairs to wooden equipment are now being made north of McKees Rocks, near the works of the Pressed Steel Car Company. A new shop is also being built at Struthers, Pa., to make repairs to wooden coal cars as they are received from other roads and before they are sent to the mines for loading.

VARIABLE LOAD BRAKE.

A brake of this type that permits of a variation in brake shoe pressure according to the load on the car to which it is applied has been developed by the Bettendorf Company, Bettendorf, Iowa. The advantages claimed for it as compared to the present brake arrangement are: Increased braking power when the car is loaded and a corresponding decrease when not loaded, thereby reducing the tendency to slide the wheels; increased braking power of one truck if that truck is loaded heavier than the other; ease of maintenance and renewal of its parts; automatic in action, and the less likelihood of pulling mixed trains in two on an emergency application of the air brakes.

The device is based on the idea of applying the brake

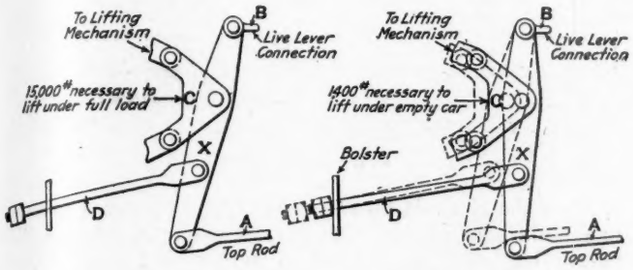
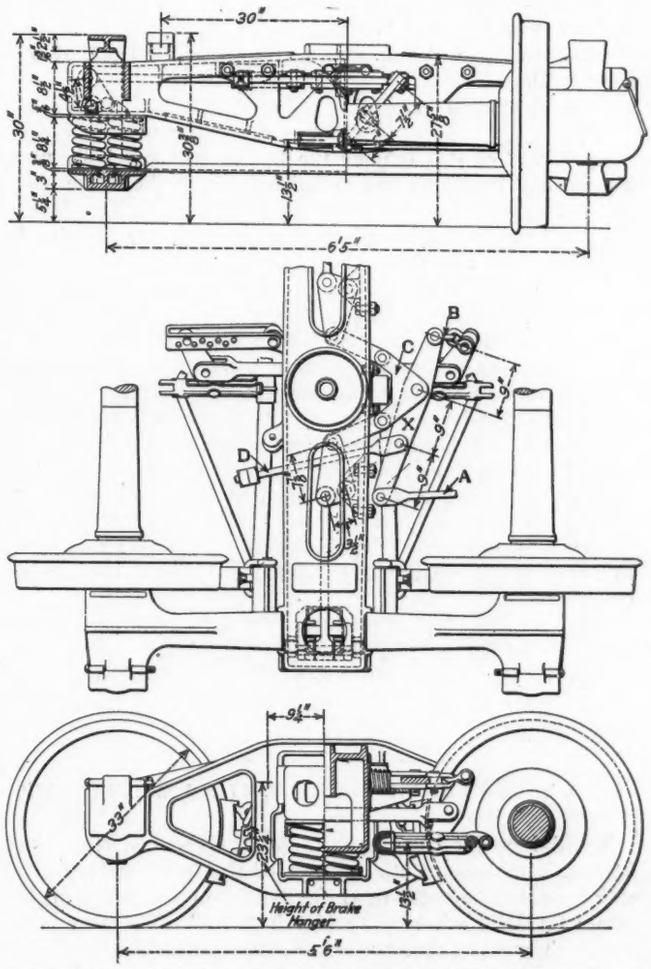


Fig. 1—Car Loaded. Fig. 2—Car Unloaded.

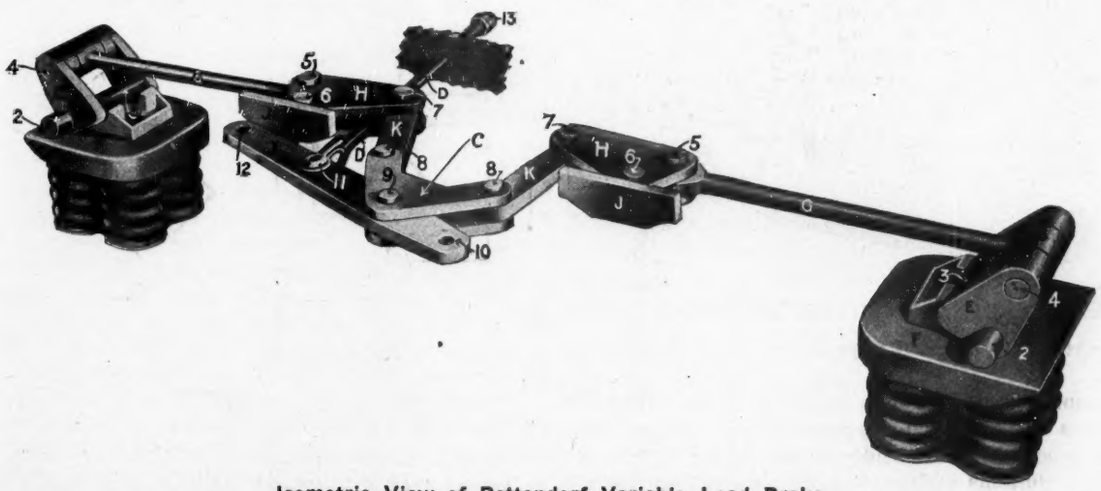
Arrangement of Levers for Light and Loaded Car.

cylinder and lever proportions for the desired load weight brake power and utilizing a series of parts (which are capable of lifting the car body) as a fulcrum for one of the levers. This fulcrum will not move unless the brake cylinder force becomes equal to some predetermined percentage of the downward force due to the weight of the car body and the load thereon, but when the brake cylinder force does not exceed the predetermined amount the car body will be lifted and the before mentioned lever through the movement of its primary fulcrum assumes a new position in which a supplementary fulcrum comes into play.

The action of the parts is clearly shown in the accompanying illustrations. Lever *X* has four connections; *A* is is the brake cylinder rod, *B* is the live lever connection, *C* is the connection to that series of parts capable of lifting the car body, and *D* is a connection that anchors the lever *X* when *C* moves, causing the lever to fulcrum at the pin connection between *D* and *X*. When the car is loaded to its capacity the arrangement, shown in Fig. 1, will apply. Connection *C* will not move and will act as the fulcrum for lever *X*, and there will be a greater force applied at *B*, the live lever connection, than when the fulcrum is at the *D* connection. When the car is not loaded there will be sufficient force at *C*, when the brakes are applied, to lift the car—and *C* will move to the position shown in Fig. 2—allowing the nuts on the end of the rod *D* to bear against the back of the bolster causing the lever *X* to fulcrum at its pin connection, with the rod *D*.



Bettendorf Variable Load Brake as Applied to Truck of 50-Ton Capacity Car.



Isometric View of Bettendorf Variable Load Brake.

Assuming that it takes a force of 1,400 lbs. at *C* to lift the empty car, we will have, with a 3,000 lb. pull on the rod *A* and the length of lever as shown on the general drawing,

a pull at C sufficient to lift the car and a resultant pull at B of $\frac{3{,}000 \times 9 - 1{,}400 \times 9}{18} = 2{,}200$ lbs.

With the loaded car it will take 15,000 lbs. at C to raise the car, which is not available under the above conditions. C will then act as the fulcrum giving a resultant pull at B of $\frac{3{,}000 \times 18}{9} = 6{,}000$ lbs.

By means of this scheme the load of the car body plays a part in determining the effective force at the brake shoes and both the amount of brake cylinder force and weight of the car body and the load thereon is necessary for the determination of the brake shoe force.

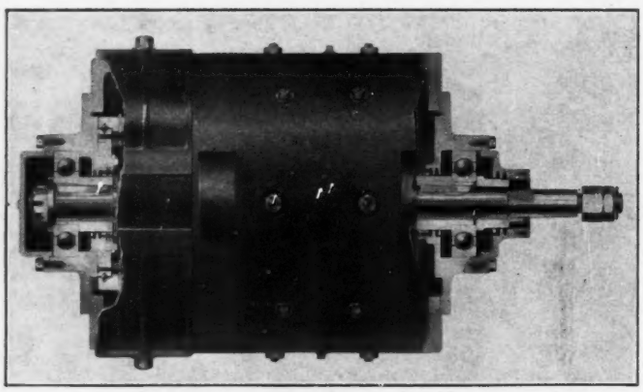
If 1,400 lbs. is the resistance offered by the empty car body when the car is lightly loaded the resistance will increase as the load increases. Hence the 1400# effective at C with an empty car will gradually increase as the load increases, and in so doing effects the resultant force at the top of the live lever so long as the brake cylinder force is sufficient to lift the car body and load thereon.

This lever combination with its many variations, makes it possible to secure almost any desired range of empty and load weight brake power for any constant air brake cylinder force, and especially so when a spring is interposed to partially balance the lifting force at C for the empty car body.

The system of levers, operating from C, for lifting the car is shown in the general drawing. This device is being exhibited at the Bettendorf booth (200) and although somewhat similar to that shown last year contains several improvements.

BALL BEARINGS ON AXLE LIGHTING GENERATORS.

The Safety Car Heating & Lighting Company, New York, has made measurements recently of the ball bearings of an axle lighting generator used constantly on a car that made a total of 137,933 miles up to March 7, 1913. These measurements show a radial wear, or wear at right angles to the axis of the shaft, of only .0005 in. on the pulley end bearings, and only .0008 in. on the commutator end bearings. The endwise or axial wear was .0005 in. on the pulley end and .0008 in.

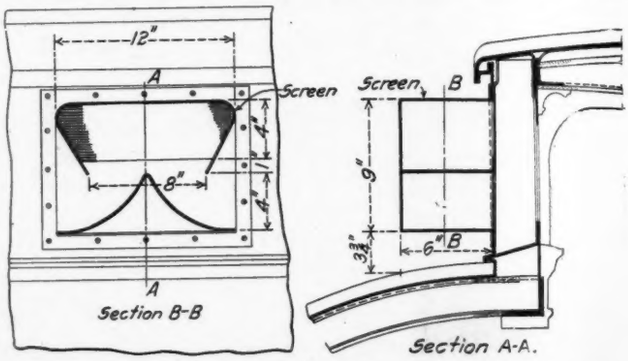


Axle Lighting Generator Equipped with Ball Bearings.

on the commutator end. The eccentricity of the pulley end bearings was .0002 in. and the commutator end bearings showed no eccentricity. Considering the severe service and exceptional conditions under which axle generators operate this is a remarkable showing and this company states that all their ball bearing generators are ivin equally satisfactory service. It is also claimed that the saving in the cost of lubrication and labor by the use of ball bearing generators soon absorbs the extra expense involved in their application.

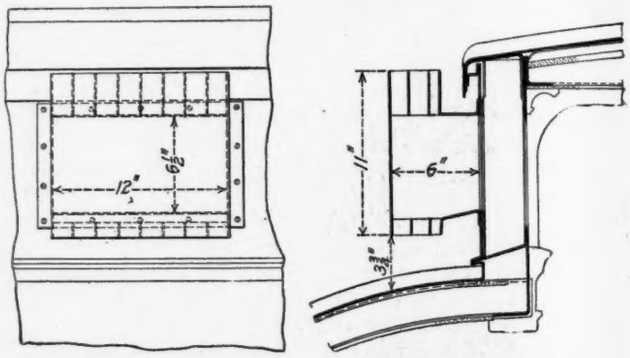
UTILITY VENTILATORS.

The Railway Utility Company, Chicago, is exhibiting a new type of intake ventilator which can be applied to either arched or clere-story car roofs, as shown in the illustrations. Whichever direction the car may be running the air



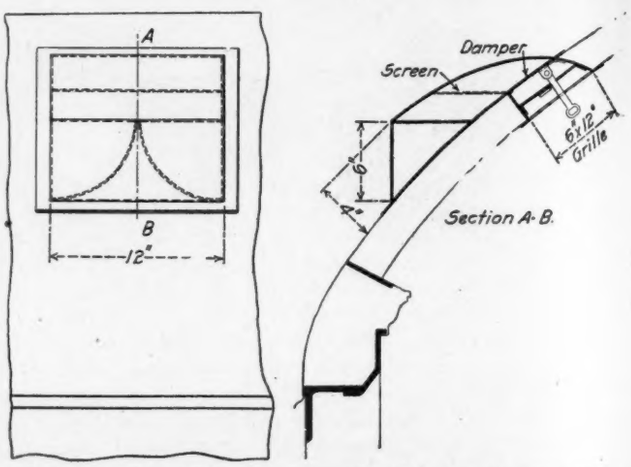
Utility Intake Ventilator Applied to a Postal Car with Clere-story Roof.

striking the chute is thrown upward and creates a pressure in the chamber in the upper part of the ventilator. It then passes into the car through a screen, but cinders, rain, snow, etc., are dropped and carried out at the other side,



Utility Exhaust Ventilator Applied to Clere-story Roof.

as there is no place for them to lodge; the air loses its velocity in the pressure chamber and the heavy particles are dropped in much the same way that sand is deposited by a river at certain points, or that snow is drifted. There is



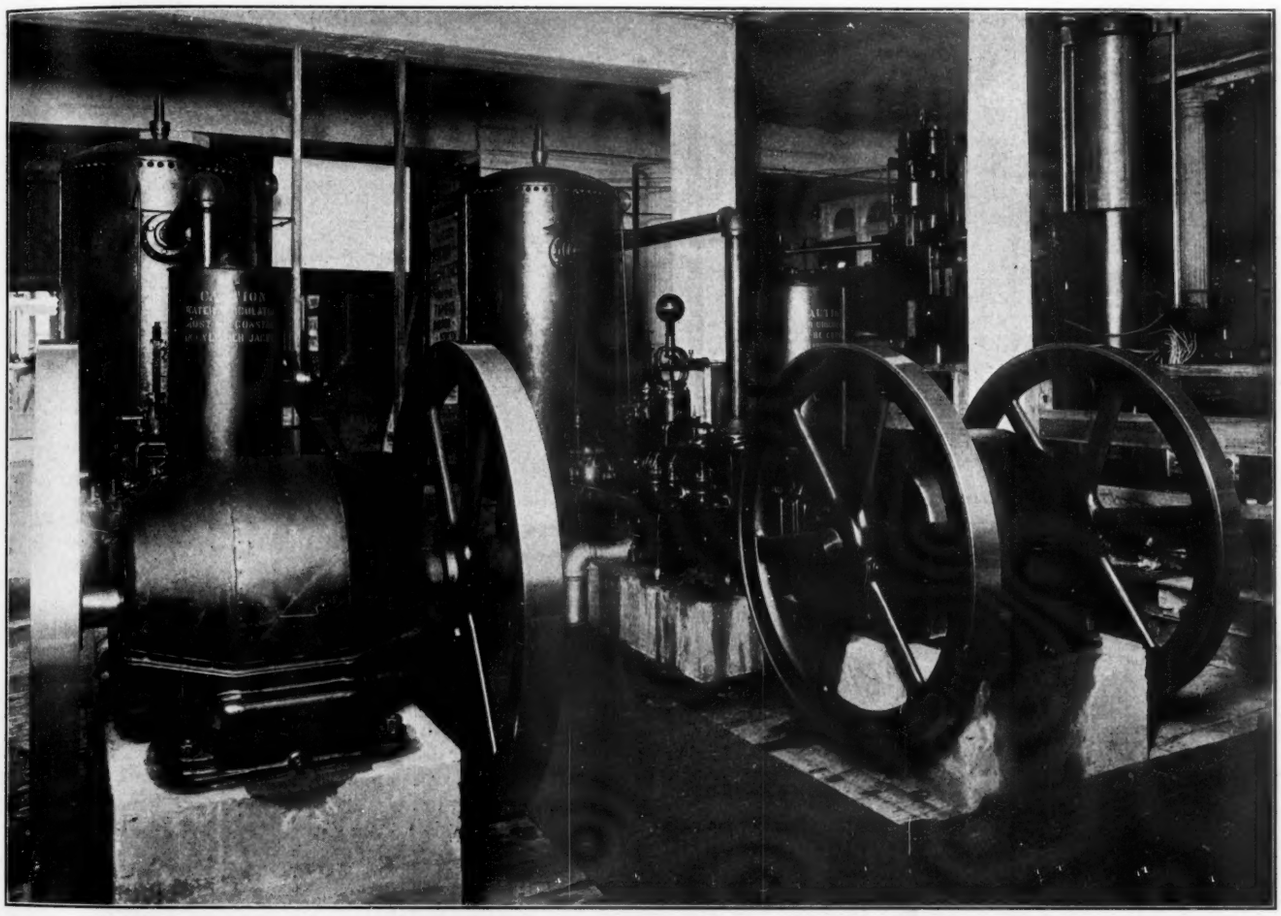
Utility Intake Ventilator Applied to a Postal Car with Arched Roof.

a certain amount of leakage of air down the chute of the ventilator, and a suction caused by this also helps to remove the foreign substances. The incoming air is passed

into the car in such a manner that it does not cause drafts or currents. The usual deck sash may be used on the inside as a means for controlling the admission of air or, if desired, a pressed steel register is furnished. The exhaust ventilators are removed a considerable distance from the intake ventilators so that there will be no tendency to take the air directly from one ventilator to the other without passing it through the car. The improved Utility exhaust ventilator is shown in one of the illustrations.

TANDEM GASOLENE DRIVEN AIR COMPRESSOR

The Chicago Pneumatic Tool Company, Chicago, is furnishing compressed air for the exhibitors, as is the usual custom, but this year the equipment consists of a pair of its latest type of tandem gasolene driven compressors. The illustration shows the pair installed on the shore end of the Pier.



Air Compressor Plant for M. M. and M. C. B. EXHIBIT.

The gas cylinder is on the rear end and the air cylinder is just ahead of it, the gas piston being direct connected to the air piston. The gas and air cylinders are bolted together by outside tie rods which make possible a simple gasket arrangement between the two cylinder joints and reduces the leakage troubles.

The lubricating system is of the self-oiling type. The air intake valves are of the Corliss type, being mechanically operated and designed to give ample openings for the entering air. The compressor is provided with a combination speed and pressure regulator and the choking type of air control. With this arrangement the gas consumption is controlled by the pressure and speed, and the amount of air to be drawn in is regulated according to the presure.

The compressors installed here have a capacity of 150 cu. ft. of free air per minute. They are rated at 30. I. h. p. and have 11½ in. gas cylinders, 8 in. air cylinders and a 12 in. stroke. The machine occupies a floor space of 11 ft. x 3 ft. 8 in. and has an approximate weight of 5,000 lbs. These machines are adapted for small capacity plants and have given splendid results in construction work. They may be mounted on a truck and be used as a portable machine, as well as a stationary plant.

STEEL CAR SEATS.

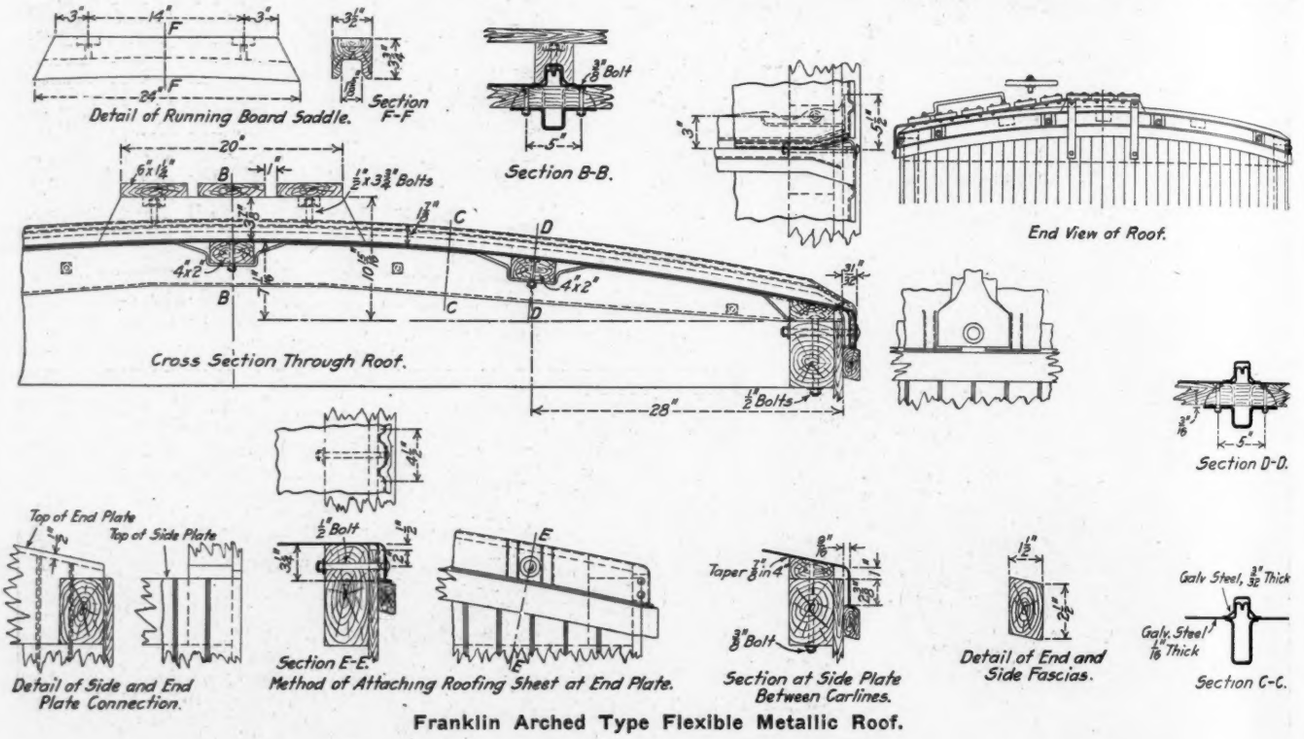
Among the exhibits of the Heywood Brothers & Wakefield Company, Wakefield, Mass., is a sample of the seat recently adopted by the New York, New Haven & Hartford for its latest steel passenger cars. This seat is made with pressed steel cushion, and back frame, and has pressed steel back corner sockets. The pedestal base and aisle end are also of pressed steel, the arm fitting the seat frame with an interlocking arrangement on which patents are pending. A similar arrangement gives a rigid fastening of the wall end of the seat frame to a pressed steel wall fixture which is permanently attached to the side of the car. The seat is attached to the monolith floor by means of a plate and binding ring on which patents are also pending. A distinctive feature of this seat is the wide arm cap which materially adds to the comfort of the passenger. The backs are upholstered plain without headroll and are sufficiently high to afford a rest for the head if desired.

NON-BINDING WRENCH.

The Barcalo Manufacturing Company, of Buffalo, N. Y., is exhibiting a pipe wrench possessing several new and interesting features. It is of simple construction, and contains but five parts, any one of which can be instantly replaced should occasion so require. It has no springs or rivets, and is so constructed as to absolutely prevent binding.

FLEXIBLE ARCHED METALLIC ROOF.

The Franklin Railway Supply Company, New York, has recently developed a new form of its flexible metallic car roof, known as the arched type. The carlines are made of 3/16 in. steel plate pressed to a U section and tapering in depth from the center of the car to the side plates. The carlines are attached to the side plate in such a manner as to give the minimum width of fascia and thus provide maximum clearance at the eaves. The roofing sheets are arched and continuous between the side plates; they are made of No. 16 gage galvanized steel and the edges adjacent to the carlines are turned up and then down. The upturned edges of the roof sheets are covered by galvanized steel carline caps, made from No. 13 gage steel and arched to the contour of the roof. Their ends are turned down over the ends of the carlines, at which point they are attached by horizontal bolts. It is claimed that with this construction any water which may get under the caps and work its way up and over the turned up edges of the roofing sheets will enter the carline and be carried to the side of the car by gravity, the carline extending beyond the side plates for this purpose. The down-turned portions of the roofing sheets extending over the side plates are spaced a distance from the plates in order to allow the sheets to move independently of the car frame; this movement occurs when the car is in service, due to the twisting action. The ridge pole and purlines are continuous from end to end and it is recommended by the manufacturers that these members be made of wood where wooden side plates are used, but that a steel ridge pole and purlines be used when steel side plates are applied.


Detail of Running Board Saddle.
Section F-F
Section B-B.
End View of Roof.
Cross Section Through Roof.
Section D-D.
Detail of Side and End Plate Connection.
Section E-E
Method of Attaching Roofing Sheet at End Plate.
Section at Side Plate Between Carlines.
Detail of End and Side Fascias.
Section C-C.

Franklin Arched Type Flexible Metallic Roof.

ACETYLENE MANTLE LAMP.

An acetylene mantle lamp, which is just being introduced in this country, is being exhibited by the Commercial Acetylene Railway Light & Signal Company, of New York. It was invented by G. Dalen, of Stockholm, Sweden, who was also the inventor of the sun dial and flasher that was awarded the Noble prize last year. A mixer used in connection with the light, and which may be installed either under or on top of the car body, provides a mixture of air and acetylene in proper proportions according to a predetermined formula. A pilot flame which uses one-third of a cubic foot of gas in 24 hours is used for lighting the lamps. No electric spark is required, and all of the lights may be lighted at one time by means of a push button in the saloon.

The lamp gives off very little heat, and the mantle will not carbonize when the gas is turned off slowly. A 90 candle power light requires about ½ cubic foot of gas per hour.

AUTOMATIC TRAIN-LINE ACCELERATING AND BRAKE CYLINDER SUSTAINING VALVE.

This valve, which is being shown by John C. Knight, Inc., New York, serves to accelerate the reduction of pressure in the train line when the brakes are applied and to maintain a uniform pressure in the brake cylinder. The method of connecting it to the brake system and its operation is as follows:

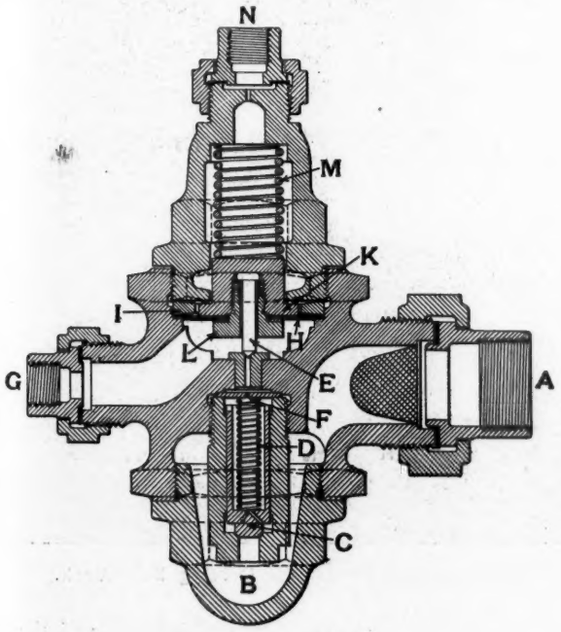
Connection is made with the train pipe at the point *A*. The air, under train-pipe pressure, then flows down to the bottom of the cap at *B* and presses upward against the valve *C* tending to unseat it. The spring *D* exerts a pressure upon the top of this valve equal to an air pressure of 40 lbs. per sq. in. so that the valve becomes a differential valve, closing when the difference between the pressure above and below the valve is less than 40 lbs. per sq. in. Hence, when there is 70 lbs. of air in the train pipe the valve *C* will be held open ntil the chamber occupied by the spring *D*, up to the needle valve *E* is filled with air at a pressure of 30 lbs.. The flow of the air to the needle valve is checked by a choke bore *F* placed above or below the spring *D*. The object of this will be explained later.

Again direct connection is made to the brake cylinder at *G*. When the brake cylinder is under atmospheric pressure only, there is no movement of any of the parts except as already stated. But, when the train pipe pressure has been reduced and the triple valve has admitted air to the brake cylinder, the air, under pressure from the latter, enters at the connection *G*, and presses up against the diaphragm *H*. This diaphragm is held in place by the ring *I* and is stiffened by the plate *K*, which is drawn down to it by the bolt *L*. This diaphragm has a lift of about 1/32 in. and, as it lifts, it must compress the spring *M* and, in doing so, it raises the needle valve *E* from its seat, thus per-

mitting the air to flow from the train line into the brake cylinder. This reduces the train line pressure and in consequence causes the triple valve to move and admit more air to the brake cylinder, until the differential of 40 lbs. between the train line and brake cylinder has been reached, when the valve *C* is again closed and the draft of air from the train pipe is stopped.

The valve acts, then, only to maintain the brake cylinder pressure until a ten pound reduction has been made in the train pipe, holding a pressure of from 20 to 23 lbs. in the brake cylinder, beyond which it is inoperative. Of course, it is understood that these figures in service are dependent upon the amount of differential at which the valve is set as well as the highest train line pressure that is used, and when once put in place it cannot be tampered with or changed.

The opening *N* at the top of the valve is connected to the exhaust pipe from the triple valve. If, then, the retaining valve is open, the action of the valve is as stated. But when the retaining valve is closed the pressure in the exhaust pipe below, it enters at *N*, passes down through the choke and supplements the pressure of the spring *M* to force the diaphragm *H* down and close the needle valve *E* so that there is no flow from the train



Sauvage Car Valve.

line to the brake cylinder. This continues so long as the triple valve is in the exhaust position. But, when another train line reduction is made, or the engineer's valve is put in lap position, the triple valve moves so as to close the exhaust and the accelerating valve is, at once, thrown into action.

Reverting for a moment to the choke bore *F*, the purpose of its restricting the flow of air to the needle valve is this: As it has a sectional area less than the feed valve port in the triple valve it will not allow enough air to pass to affect the recharging of the train when brakes are in use on grades. It also prevents a sudden flow of air to the brake cylinder and consequent erratic action: When the leakage is in excess of the capacity of the choke to supply, the needle valve automatically closes and so prevents an excessive drain on the train pipe, as would be the case if any part of the brake equipment were to be ruptured. In case of an emergency application, the valve *C* acts as a check valve to prevent the flow of air from the brake cylinder to the train pipe, which is then reduced to atmospheric pressure.

At any differential that this valve may be holding in the brake cylinder, whether it be high or low, the question may be raised as to whether, with a constant brake cylinder leakage, which this valve is automatically maintaining by means of air taken from the train line, it would not tend to set the brakes still harder until equalization took place. This would occur were it not for the locomotive "sustaining" valve, whose functions and operations are described elsewhere.

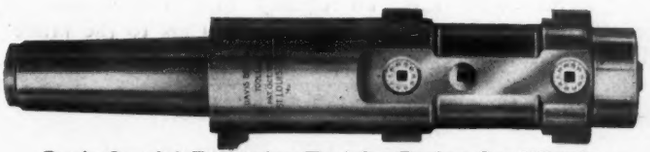
When the regular 15 lbs. retaining valves are used the connection of *N* to the exhaust pipe is necessary; but, when special retaining valves holding 25, 30 or 50 lbs. are used this connection is omitted and *N* is left open direct to the atmosphere.

Finally when all conditions are normal and a ten pound reduction is made there is no action of this valve; but if, on any car, there is an excessive piston travel so that the pressure does not come up at once, then the valve comes into play and builds the pressure up immediately to what it should be.

The value of this valve lies in its ability, when a train is descending a long grade, to hold the brake cylinder pressure in what amounts to a straight air condition of application, with a uniform pressure, making it possible for the engineer to leave his brake valve handle in running position, charging the auxiliary reservoirs, and, at the same time holding up any leaks that there may be in the brake cylinders or their connections, and preventing the speed of the train from becoming excessive, while recharging. This, in conjunction with the locomotive trainline sustaining valve allows the engine driver to raise or lower the brake cylinder pressure according to the conditions of the grade permitting him to know the cylinder pressure that he is maintaining at all times, either in application or release position when the retaining valves are in use.

EXPANSION BORING TOOL.

Among the tools which are being exhibited by the Davis Boring Tool Company, St. Louis, Mo., is an expansion car wheel boring tool that is intended for car building or other large shops that have great numbers of wheels to bore to standard gages or to fit axles. This tool has the cutters so placed that when the roughing cutters pass through, the finishing cutters enter immediately, so that the boring of the wheel is accomplished



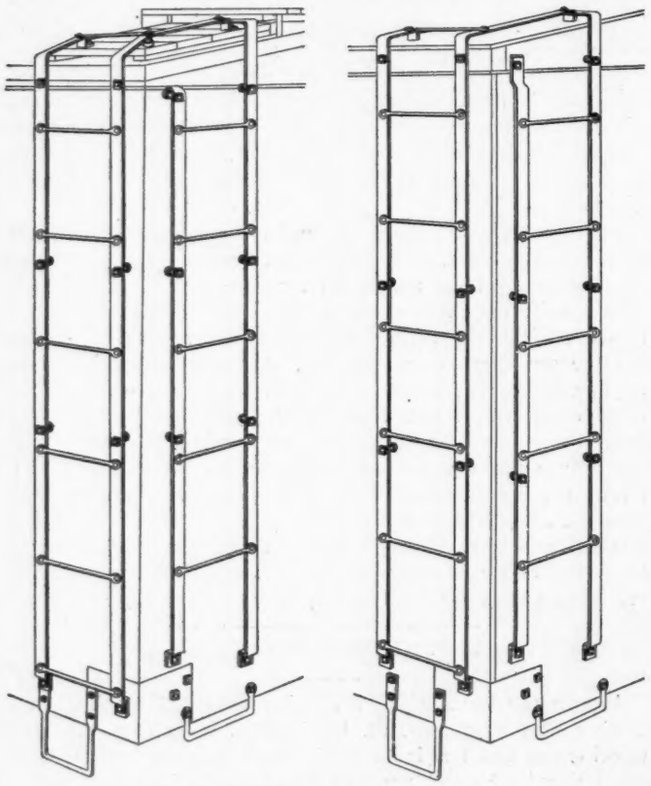
Davis Special Expansion Tool for Boring Car Wheels.

in two separate cuts, but with one continuous feed. As soon as the finishing cutters have passed through the wheel, it is chamferred to prevent it from cutting the axle while being pressed on. It is claimed for this tool that it has bored twenty cast iron wheels per hour, for 5½ in. by 10 in. axles, in two separate cuts. In addition to boring tools for general service, this company is also exhibiting a tool for boring driving wheel centers and tools for use on turret lathes and boring machines.

SAFETY BOX CAR LADDER.

The Safety Steel Ladder Company, St. Louis, Mo., is exhibiting a full sized end of a box car equipped with a safety steel ladder, as shown in the illustration. This ladder was designed to facilitate the bringing of the ladder equipment of box cars within the requirements of the United States Safety Appliance Law. The rungs are riveted to stiles made from bar steel, and those parts of the ladder on the body of the car are spaced to a convenient position by putting cast iron furring spools back of the stiles on the intermediate bolts and by bending the stiles outward from the bottom bolts where necessary. Spacing on top of the car roof is effected by bending the projecting stiles parallel with the

roof, and by further bending the stile ends downward. The top construction differs somewhat for wood and metal roofs, but in both instances the roof grab irons are a solid part of the main ladders and require no holes in the roof. On wooden roofed cars the stile ends of the side ladder bear squarely on the roof and the stile end of the end ladder



All-steel Safety Box Car Ladder.

is bolted to the side ladder stile, thus leaving no part on which trainmen would be apt to catch their feet or clothing. On metal-roofed cars, an equally safe arrangement is effected by bolting the side ladder stile ends to the brakeman's platform.

SMALL STEEL CASTINGS.

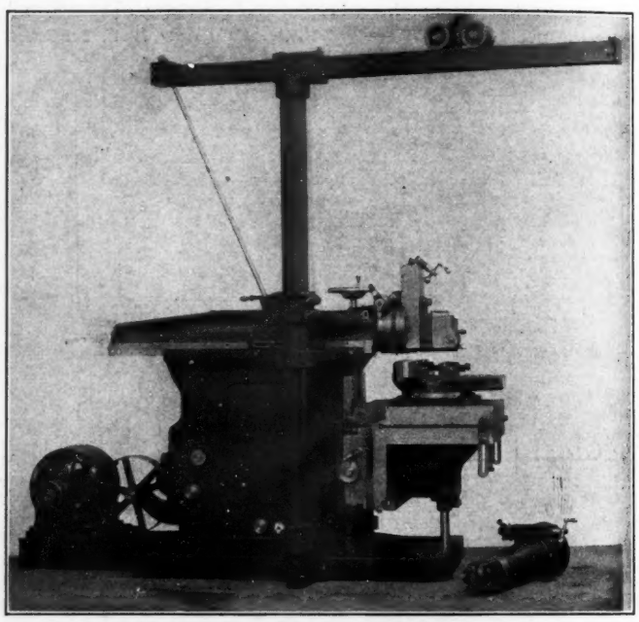
The Standard Steel Castings Company, Cleveland, Ohio, has recently been formed for the production of steel castings, weighing from one pound to 1,000 lbs. Special care is used in making the models to provide a finished casting

Steel Castings Made by the Standard Steel Castings Company.

free from sand holes, thereby making a casting that may be easily machined. The illustration shows a group of castings just as they were taken from the molds. The casting at the right was bent cold and was unannealled, no cracks developing into the casting. No sand blast is required to clean these castings. The converter process is used in making the steel and the company makes a specialty of blank gearing and small parts. The foundry is in charge of John H. Davis, formerly superintendent of the foundry for the Otis Steel Company. The new plan is provided throughout with new equipment and has a capacity of 15 tons per day. The company has produced successfully castings 3-16 in. thick.

HEAVY DUTY BACK GEARED SHAPER.

Among the machine tools in the exhibit of the Cincinnati Shaper Company, Cincinnati, Ohio, is a 32 in. back geared shaper adapted for round house work, and especially locomotive driving boxes. It is equipped with a draw cut head and, in addition, has an extended circular feeding head for driving box work, which also works on the draw cut prin-



Back Geared Shaper for Driving Box Work.

ciple. The table is provided with a tilting top, and the machine is equipped with a crane of 1,000 lbs. capacity for lighting the work in and out. A constant speed motor is used, and is belt-connected to the shaper, which is driven through a gear box. A planing attachment for rod brasses is also provided. The weight of this machine is 9,200 lbs.

BURGLAR-PROOF DEVICES.—A burglar-proof stop, lock and hasp arrangement, as well as a burglar-proof bracket for car doors, is being exhibited by the Camel Company, Chicago. The former arrangement prevents the splitting out of the door stop at the front edge of the door and has a burglar-proof sealing arrangement. The bracket is so designed that it is impossible to remove it while the door is in the bracket.

MAJOR COUPLERS.—At the Buckeye Steel Castings Company's exhibit, Booths 603-605, a comparison is made between the experimental coupler developed by this company, as its part of the work of the M. C. B. Coupler committee, and its present Major top-lift and under-lift couplers. The Major couplers are probably as heavy as any of the couplers now in use. But in the experimental design, much greater strength and weight are provided and special attention has been given to the further development of the under-lift or side operation and the possibility of doing away entirely with the over-head operating rods and chains.